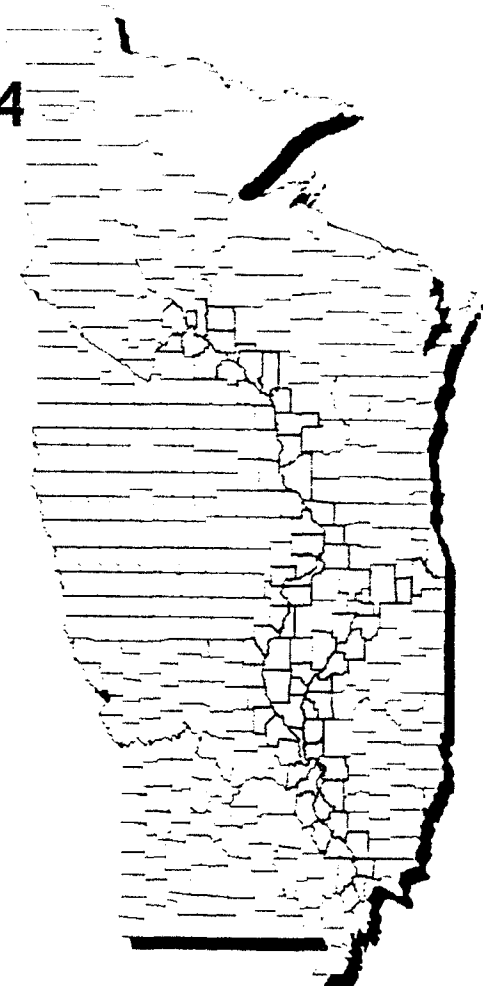


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# ECONOMIC IMPACTS OF RECREATION

## ON THE UPPER MISSISSIPPI RIVER SYSTEM

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<p>The purpose of this report is to provide measurement of recreation-related spending in the Upper Mississippi River system. The report is divided into two parts. Part one presents both trip and durable goods spending profiles for visitors to developed recreation areas on the Upper Mississippi River system. Spending was measured through a series of on-site interviews used to measure recreation use and durable goods, and a mailback questionnaire which measured trip spending was ten distributed to visitors responding to the on-site interview. The study design captured the most significant segments and categories of spending. For day users, residents outnumber nonresidents by more than five to one. Among overnight visitors, nonresidents were more than twice as numerous as residents.</p> <p>The second part provides both trip and durable goods spending profiles for dock owners and marina users. These spending profiles were derived from the household telephone and mail-back questionnaire phase of the total study.</p> <p>Many tables included which provide data on user profiles and expenditures.</p>					
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DEVELOPMENT OF VISITOR SPENDING PROFILES  
FOR THE UPPER MISSISSIPPI RIVER SYSTEM

by

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In 1986, Congress authorized a study to assess the economic importance of recreation in the Upper Mississippi River System. The study findings have been published in a series of reports by the U.S. Army Corps of Engineers, St. Paul District. A listing of these reports follows:

- Plan of Study for the Recreation Economics Study on the Upper Mississippi River System (September 1986)
- Recreation-Economics Data Review, Upper Mississippi River Basin (February 1988)
- Economic Impacts of Recreation on the Upper Mississippi River System: Study Sampling Plan (May 1989)
- Economic Impacts of Recreation on the Upper Mississippi River System: Recreation Use and Activities Report (March 1993)
- Economic Impacts of Recreation on the Upper Mississippi River System: Recreation Expenditure Report (March 1993)
- Economic Impacts of Recreation on the Upper Mississippi River System: Economic Impacts Report (March 1993)
- Economic Impacts of Recreation on the Upper Mississippi River System: Summary Report (June 1993)

A related document summarizes the economic input-output model applications prepared in conjunction with this study:

- MI-REC: Micro-Implan Recreation Economic Impact Estimation System Users' Manual

## CONTENTS

INTRODUCTION . . . . .	6
PURPOSE . . . . .	6
PART ONE: DEVELOPED RECREATION AREA VISITORS; RECREATION SPENDING ON THE UPPER MISSISSIPPI RIVER SYSTEM . . . . .	7
BACKGROUND . . . . .	9
PROCEDURES . . . . .	9
National Study and Current Study Compared . . . . .	10
Survey Site Selection . . . . .	11
Subregions . . . . .	11
Survey Procedures . . . . .	11
RESULTS . . . . .	15
Sample Sizes and Response Rates . . . . .	15
Visitor Segments . . . . .	17
Nights Spent per Trip . . . . .	23
Trip Expenditures . . . . .	26
Durable Goods Spending . . . . .	39
LIMITATIONS . . . . .	52
DISCUSSION . . . . .	55
APPLICATIONS OF RESULTS . . . . .	59
SUGGESTIONS FOR FURTHER RESEARCH . . . . .	61
LITERATURE CITED - PART ONE . . . . .	64
APPENDIX A: ON-SITE INTERVIEW INSTRUMENT AND DURABLE GOODS FORM . . . . .	65
APPENDIX B: MAILBACK QUESTIONNAIRE . . . . .	77
APPENDIX C: TRIP SPENDING STATISTICS . . . . .	83
APPENDIX D: DATA CLEANING AND EDITING TASKS . . . . .	91
 PART TWO: DOCK OWNERS AND MARINA USERS; RECREATION SPENDING ON THE UPPER MISSISSIPPI RIVER SYSTEM . . . . .	 95
BACKGROUND . . . . .	97
PROCEDURES . . . . .	97
Sample Selection . . . . .	98
Methods . . . . .	98
Trip Spending Analysis . . . . .	99
Durable Goods Analysis . . . . .	101
Residents versus Nonresidents . . . . .	102
RESULTS: DOCK OWNERS . . . . .	103
Sample Sizes and Response Rates . . . . .	103
Trip Expenditures . . . . .	104
Durable Goods Spending . . . . .	110

RESULTS: MARINA SLIP RENTERS . . . . .	117
Sample Sizes and Response Rates . . . . .	117
Trip Expenditures . . . . .	117
Durable Goods Spending . . . . .	124
DISCUSSION . . . . .	130
Visitor Segment Profiles . . . . .	132
Sampling Error . . . . .	135
Limitations . . . . .	136
Applications . . . . .	137
LITERATURE CITED - PART TWO . . . . .	139

# LIST OF TABLES

## Part One

<u>Table</u>		<u>Page</u>
1	On-site interview and mailback questionnaire sample sizes and response rates by season and region, UMRS study (1989-90) . . . . .	16
2	Mailback questionnaire response rates by visitor segmentation variable, UMRS study (1989-90) . . . . .	13
3	Corps of Engineers visitor segments judged to be homogeneous with respect to their spending patterns, UMRS study (1989-90) . . . . .	20
4	On-site interview and mailback questionnaire sample sizes by 12 segments and 6 segments, UMRS study (1989-90) . . . . .	22
5	Sample distribution by the four segmentation variables, UMRS study (1989-90) . . . . .	24
6	Distribution of six visitor segments by five regions (UMRS study 1989-90): On-site surveys . . . . .	25
7	Nights spent per trip by location, UMRS study (1989-90): Overnight parties only . . . . .	27
8	Average trip spending for 33 detailed mailback expenditure items and 8 aggregate spending categories, UMRS study (1989-90) . . . . .	28
9	Average trip spending by six visitor segments for 33 detailed mailback expenditure items and item subtotals, UMRS study (1989-90) . . . . .	30
10	Average trip spending by region UMRS study (1989-90) . . . . .	34
11	Distribution of trip spending by segment and region, UMRS study (1989-90) . . . . .	36
12	Selected statistics for trip spending by detailed expenditure items, major subcategories, and segment, UMRS study (1989-90) . . . . .	37
13	Durable goods equipment items and codes, UMRS Study (1989-90) . . . . .	40
14	Percentage of UMRS visitors with durable goods equipment by segment . . . . .	41
15	Durable goods spending per party per trip by segment and major category of durable goods . . . . .	43
16	Percent of durable goods expenditures occurring within UMRS region by segment and type . . . . .	44
17	Distribution of durable goods spending by segment and region . . . . .	45
18	Spending on durable goods by type, UMRS visitors . . . . .	47
19	Durable goods spending by segment and category . . . . .	48
20	Durable goods spending estimates by region (\$ per party trip) . . . . .	51

TablePage

21	Sampling errors for durable goods spending estimates . . . . .	83
----	--	----

Part Two

1	Dock owner sample sizes and response rates (UMRS study, 1990-91) . . . . .	103
2	Average trip spending for 33 detailed mailback expenditure items and 8 aggregate spending categories, UMRS Dock Owners Study (1990-91) . . . . .	105
3	Average trip spending by dock owner residents and nonresidents for 33 detailed mailback expenditure items and 8 aggregate spending categories . . . . .	107
4	Selected error statistics for trip spending per week by detailed expenditure items and aggregate categories, UMRS Dock Owners Study (1990-91) . . . . .	109
5	Spending on durable goods by type, UMRS dock owners . . . . .	111
6	Durable goods spending by place of purchase and place of residence, UMRS dock owners . . . . .	113
7	Durable goods spending on new versus used goods by type, UMRS dock owners . . . . .	114
8	Sampling errors for durable goods spending estimates, UMRS dock owners . . . . .	115
9	Other annual or durable goods expenses by type, UMRS dock owners . . . . .	116
10	Marina user sample sizes and response rates (UMRS study, 1990-91) . . . . .	118
11	Average trip spending for 33 detailed mailback expenditure items, and 8 aggregate spending categories, UMRS Marina Users Study (1990-91) . . . . .	119
12	Average trip spending by marina user residents and nonresidents for 33 detailed mailback expenditure items and 8 aggregate spending categories . . . . .	121
13	Selected error statistics for trip spending per week by detailed expenditure items and aggregate categories, UMRS Marina Users Study (1990-91) . . . . .	123
14	Spending on durable goods by type, UMRS marina users . . . . .	125
15	Durable goods spending by place of purchase and place of residence, UMRS marina users . . . . .	127
16	Durable goods spending on new versus used goods by type, UMRS marina users . . . . .	129
17	Sampling errors for durable goods spending estimates, UMRS marina users . . . . .	130



Table

Page

18	Other annual or durable goods expenses by type, UMRS marina users . . . . .	131
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## INTRODUCTION

In 1986, Congress authorized a study to assess the economic importance of recreation in the Upper Mississippi River System (UMRS) (Public Law 99-88). This study, administered by the Corps of Engineers, St. Paul District, and supervised by a multi-agency Technical Review Team (TRT), has two distinct but related components:

1. measurement of the amount and type of recreation use in the UMRS through the use of on-site interviews at public access sites in the study area and telephone interviews of households that rent marina slips or have permitted boat docks, and
2. measurement of recreation-related spending by the respondents in component one. Durable recreation goods spending will be measured through the on-site interviews and initial phone calls, while variable trip spending will be measured with a self-administered mailback questionnaire.

## PURPOSE

The purpose of this report is to document the work completed under component two of the study: measurement of recreation related spending in the UMRS. The report is divided into the following two parts reflecting different populations measured in the study:

Part One: Developed Recreation Area Visitors:  
Recreation Spending on the Upper  
Mississippi River System

Part Two: Dock Owners and Marina Users: Recreation  
Spending on the Upper Mississippi River  
System

Recreation Spending reported in this document served as the basis for economic impact estimates of recreation use of the UMRS presented in separate reports on other aspects of this study.

PART ONE  
DEVELOPED RECREATION AREA VISITORS;  
RECREATION SPENDING ON THE UPPER  
MISSISSIPPI RIVER SYSTEM

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## BACKGROUND

This portion of the report presents both trip and durable goods spending profiles for visitors to developed recreation areas on the UMRS. Spending was measured through a series of on-site interviews used to measure recreation use and spending on durable goods. A mailback questionnaire which measured trip spending was then distributed to visitors responding to the on-site interview.

The remainder of this part is divided into the following major sections: PROCEDURES, RESULTS, LIMITATIONS, DISCUSSION, APPLICATIONS OF RESULTS, and SUGGESTIONS FOR FURTHER RESEARCH.

The Procedures section outlines general data collection and analysis methods used to measure recreation spending. The RESULTS section reports trips and durable goods spending for user groups possessing similar spending patterns. The LIMITATIONS section discusses sampling and measurement issues that should be considered when applying the results. The DISCUSSION section presents several general issues associated with the methods selected to analyze and present the survey results. The APPLICATIONS OF RESULTS section discusses options for directly presenting the results of the spending survey and incorporating survey results into economic impact studies. The SUGGESTIONS FOR FURTHER RESEARCH section identifies further analysis of the existing data set which would improve the precision of economic impact assessments.

## PROCEDURES

Detailed discussions of the sampling design and data collection methods utilized in this study are provided in three documents: Propst and Stynes (1989), Propst et. al (1992), and U.S. Army Engineer, Waterways Experiment Station (1989a and 1989b). Propst and Stynes (1989) provides a discussion of (a) the design of the survey instruments and (b) data analysis procedures. The U.S. Army Engineer (1989a) document is the Scope of Work (SOW) for the entire UMRS study of which this report is one component. The SOW describes the overall study, specifies data analysis and reporting requirements and provides detailed site maps. U.S. Army Engineer (1989b) is a detailed rationale and discussion of the sampling plan for the UMRS study. Propst et al. (1992) is the final report of an earlier but similar study. Hereafter called

the "national study." Propst et al. (1992) developed visitor expenditure profiles associated with the recreational use of a representative sample of COE projects in the United States. The data collection instruments and analysis techniques are nearly identical in Propst et al. (1992) and this report.

#### Current Study and National Study Compared

This study and the national study (Propst et al. 1992) were almost identical in the survey instruments used but quite different with respect to the sampling design. The purposes of the national study and the UMRS study are also somewhat different. The purpose of the UMRS study was to measure both visitor use and visitor spending along the UMRS. The intent was to achieve a representative sample of visitors to the UMRS. This purpose required that both recreation sites and visitors were randomly selected. This random selection of sites and visitors is the key distinguishing feature between the current study and the national study. Unlike the national study, there was no attempt in this study to represent the full national range of spending behavior by COE visitors. Instead, the focus was on deriving both use and spending estimates in proportion to the population of visitors within one specific geographic region: the UMRS.

The purpose of the national study was not to obtain a representative sample of visitors at any given lake, but to garner a reasonable quota of parties across all lakes within each of the visitor segments thought to be homogeneous with respect to their spending patterns. To this end, certain segments were oversampled with respect to their true proportion in the population while others were undersampled. Unlike the current study, no attempt was made in the national study to estimate visitor use from the on-site interview procedures. In the national study, estimates of visitor use were obtained from the internal reporting methods and documents developed by each of the 12 COE projects where spending data were collected.

Similar to the national study, the goal of this study was to measure the total amount spent on a recreation trip, the distribution of that spending among economic sectors, and the geographic location of spending in relation to the UMRS. As in the national study, spending profiles were derived for major subgroups of visitors.

## Survey Site Selection

On-site interviews were conducted at 150 of the approximately 600 recreation sites in the study region. Efforts were made to ensure representation of sites across the spectrum of providers (commercial recreation enterprises; local, state, and federal agencies) and dominant activity types (sightseeing areas, boat ramps, campgrounds, etc.). Specific details regarding the sampling design are provided in (U.S. Army Engineer 1989a and b). In summary, sites were randomly assigned to several strata reflecting locational (subregions within the UMRS), temporal (season, month, weekday vs. weekend, and morning vs. afternoon vs. evening), and visitation-related (high vs. low use areas) use patterns. Unlike the national study, the interview locations were not necessarily on Corps property.

## Subregions

For the purposes of this study, the Corps of Engineers divided the UMRS into 5 subregions: St. Paul District, Rock Island District, St. Louis District, Illinois River Waterway, and "sightseeing areas." The first 4 subregions represent true geographic boundaries corresponding to the locations of "pools" created by a series of locks and dams constructed and maintained by the Corps of Engineers. The St. Paul District roughly includes that portion of the Mississippi River that forms the boundary between Wisconsin and Minnesota south of Minneapolis/St. Paul. The Rock Island District includes most of the eastern boundary of the state of Iowa plus the northern half of the western boundary of Illinois and a portion of northeastern Missouri. The St. Louis District covers the rest of Illinois' western boundary plus the eastern boundary of the state of Missouri southward to the confluence of the Mississippi and Kaskaskia Rivers (south of St. Louis). The Illinois River Waterway is contained entirely within the state of Illinois and extends from St. Louis almost to Chicago. The "sightseeing areas" do not represent a separate subregion. Sightseeing areas include visitor centers and scenic overlooks that may be located anywhere within the UMRS.

## Survey Procedures

Economic impact analysis utilizing IMPLAN requires the development of visitor expenditure "profiles." A trip expenditure profile is a vector of expenditures for individual goods and services purchased during a recreation trip (gasoline, equipment rental, etc.). Similarly, durable goods expenditure

profiles may be created for goods (boats, recreation vehicles, etc.) that are used on trips to the UMRS (and often elsewhere) over a period of time.

To develop both trip and durable goods expenditure profiles, a sample survey was conducted at 150 sites along the UMRS between November 15, 1989 and December 15, 1990. Thus, the survey period allows for reporting of results on an annual or seasonal basis. Data collection procedures included a combination of personal, on-site interviews and mailback questionnaires (Appendix A and B).

The other contractor was responsible for supervising the interviewers that collected the on-site interview data. Furthermore, the other contractor coded, edited, and entered the on-site data as DBase files. The other contractor sent these files to COE staff in the St. Paul District for further verification before they were sent to Michigan State University (MSU) for analysis.

During the on-site interviews, visitors provided recreation activity information, durable goods spending estimates, and trip characteristics. To meet the requirements of I/O analysis, much of this information was gathered on a regional basis. For example, respondents were asked to report place of residence as being either within the UMRS as previously defined or outside the UMRS. They were also asked to report the county where durable goods purchases were made and to divide trip-related expenses into two groups: expenditures within 30 miles of the interview site and expenditures beyond 30 miles.

Data Processing. A number of data cleaning and editing tasks were performed. These tasks, described in Appendix D, included the joining of the mailback and on-site data sets and the removal of outliers.

Trip Expenses. To obtain variable trip costs, visitors were asked to complete an expense questionnaire (Appendix B) and return it by mail as soon as possible after they had returned to their permanent residence. The mailback questionnaire asked for trip expenses for as many as 33 items per trip. Parties were asked to report the dollar amount spent per category both within 30 miles of the interview site and outside 30 miles. These "local" and "nonlocal" spending figures were summed to derive a total trip spending estimate.

Sufficient information was duplicated (e.g., site, data, identification number) in the on-site and mailback surveys so that data from the same party could be merged at a later date.



The two-stage, interview and mail survey procedure was utilized to avoid confusion on the part of the respondent and to elicit reliable and complete trip spending information. Propst et al. (1991) found that dividing the questions between two instruments not only substantially lowered the length of the interview but also lessened confusion between trip and durable goods expenses. Furthermore, since a major objective of this study was to measure total trip spending, providing the respondents a mailback questionnaire and asking them to return it upon return to their residence, enables the estimation of spending for the entire trip. Moreover, the two-step design permits the use of on-site interview data to evaluate and adjust for nonresponse bias in the mailed survey.

This study employed a relatively standardized procedure for improving mailback response rates: the use of two follow-up, mailed reminders. Following Dillman (1978) the first reminder was a postcard mailed to nonrespondents approximately two weeks from the reported end of their current trip. The second reminder was a certified mailing consisting of a different cover letter and another questionnaire. The second reminder was mailed approximately one month after the end of the trip (two weeks after the postcard reminder).

Durable Goods. Spending on durable goods was measured in the on-site portion of the survey. Sampled visitors were asked to report durable goods brought with them on their current trip for use within the UMRS (see Appendix A, questions 42-51). For each major durable goods item (Table 13, List No. 1), the type, year of purchase, cost, county of purchase, and whether the item was purchased new or used was measured. These variables were also gathered for each smaller durable goods item (Table 13, List No. 2) purchased within the past year.

The 40 durable goods categories, including separation of new and used items, were designed to insure consistency with IMPLAN sectors as much as possible. Up to 10 durable goods per interview were coded. The location of purchase was coded as county or city names. At MSU, these names were edited and recorded into county Federal Information Processing Standard (FIPS) codes.

The purpose of the analysis of durable goods equipment spending was to generate profiles comparable to the trip spending profiles. A difference between durable goods purchases and trip spending is that durable goods may be used on many different trips and at different sites. This presents difficulties in attributing a portion of the spending to use of the UMRS during the

study period. To partially account for this problem (i.e., the multiple-trip issue), durable goods spending was converted to an annual and per trip basis. As was the case with trip spending, an average spending per party per trip was desired. This number can be multiplied by party trips per year to obtain an annual estimate of total spending on durable goods associated with trips to the UMRS.

We emphasize the qualifier "associated with" as durable goods items used on the UMRS may also be used elsewhere. We do not attempt to apportion the costs of durable goods to UMRS sites versus other places where they may be used, for example, based on frequency of use on the UMRS vs. elsewhere. Any such allocation must be largely ad hoc. Lacking valid methods for allocating durable goods costs across multiple sites, one must either assume the durable goods would not have been purchased if opportunities to use this equipment along the UMRS did not exist, or one must refer to durable goods expenses as "associated with trips to the UMRS." Adjusting durable goods costs to a per trip per year basis does not account for the portion of durable goods costs that could be associated with other sites where that equipment may be used. This problem is discussed further in the limitations section.

To obtain estimates of durable goods spending on a party trip basis, the cost of each durable goods item was divided by the number of trips that the party had taken to the UMRS within the past year. For durable goods from List No. 2 in Table 13, only goods purchased within the past year were included in order to obtain an annual estimate. For major durable goods (List No. 1 in Table 13), items purchased in the last 6 years were included, but the resulting estimates were divided by six to put estimates on an annual basis.

The choice of a 6-year period for major purchases was based upon an examination of results based on all purchases, durable goods purchased within the past 6 years, and durable goods bought within the past year. Using 6 years of data provides a larger sample of durable goods than the 1-year figures, while also avoiding the inclusion of items purchased many years ago at presumably much lower prices. This procedure distributes the costs of durable goods evenly across several years under the assumption that the past year is representative of the number of trips per year to the UMRS for each party. The cost estimates will be somewhat understated as we did not attempt to adjust for price increases in durable goods costs over the 6 year period. Based on IMPLAN deflators for relevant durable goods sectors, changes in durable goods prices from 1985 to 1990 were less than five percent. Of 983 items

reported from List No. 1. 234 items were purchased within the past year and half were purchased within the previous 6 years. The sample of items purchased within the past year was particularly weak for estimating purchases of major camping equipment.

To avoid problems caused by small sample sizes for particular segments or durable goods items and large variation in durable goods expenses across items and parties, we estimated durable goods spending at aggregate levels first. Profiles of durable goods spending by segment and detailed equipment categories were produced by distributing the spending estimated in major categories (boat, hunt, fish, camp, and other) to detailed subcategories according to the proportions of durable goods spending reported over the past 6 years in the full sample.

## RESULTS

The results section is divided into four major parts. The first part provides sample size and response rate information. Part two discusses the formation and selection of visitor segments, segment distribution in the samples, and length of stay for overnight segments. Part three reports the findings pertaining to trip spending (mailback portion of study). Part four describes the results of the durable goods analysis.

### Sample Sizes and Response Rates

A total of 1,697 parties, defined as occupants of one vehicle, were approached (Table 1). Three hundred eighty-one (381) of the parties refused to be interviewed. The range of interview refusals was 46 refusals (12.1%) in the winter season to 160 (42.0%) in the spring. By region, a low of 11 refusals (3.1%) in the St. Paul District and a high of 141 (37.0%) in the St. Louis District were encountered. Two hundred twenty-eight (228) of the interviewed parties declined to participate in the trip expense portion of the study, leaving a mailback sampling frame of 1,088 parties (1,316 minus 228). Of the 1,088 parties who agreed to participate in the mailback portion of the study, 683 parties returned useable trip expense questionnaires, yielding a response rate of 62.8 percent. At least 90 of the non-responding parties did not receive follow-up reminders due to insufficient or wrong addresses. Because interviewers were not allowed to obtain the names of persons interviewed, it was nearly impossible to deliver the reminders to them.

Table 1. On-site interview and mailback questionnaire sample sizes and response rates by season and region, UMRS study  
(Nov. 15, 1989 to Dec. 15, 1990).

	Seasonal Distribution (%)					Regional Distribution (%)				
	Totals	Winter	Spring	Summer	Fall	St. Paul	Rock Island	St. Louis	Ill. River	Sight-seers
Useable On-site Interviews(1)	1,316	8.8%	20.0%	42.9%	28.3%	24.1%	26.6%	17.9%	10.7%	20.6%
On-site Interview Refusals(2)	381	12.1%	42.0%	33.1%	12.8%	3.1%	24.9%	37.0%	15.0%	20.0%
Mailbacks Distributed(3)	1,088	8.6%	28.1%	37.3%	25.9%	22.8%	31.6%	18.8%	8.8%	17.9%
Mailbacks Received	713	6.3%	20.3%	39.0%	34.4%					
Useable Mailbacks	683	5.3%	20.6%	39.1%	35.0%	24.2%	29.1%	17.3%	9.9%	19.6%
Nonuseable Mailbacks	30	30.0%	13.3%	36.7%	20.0%					
Postcards Sent (first reminder)	789	8.6%	25.0%	39.9%	26.5%					
Postcards Returned (bad addresses)	99	9.1%	21.2%	33.3%	36.4%			(5)		
Certified Mailings (second reminder)	607	7.1%	24.2%	41.5%	27.2%					
Certifieds Returned (bad address/refusal)	96	4.2%	15.6%	44.8%	35.4%					
Response Rate(4)	62.8%	38.3%	46.1%	65.8%	84.8%	67.8%	58.9%	58.9%	71.7%	70.1%

(1) Number of completed on-site, personal interviews.

(2) Number of parties who refused to be interviewed.

(3) Mailback questionnaires were distributed to those parties interviewed on-site who agreed to return the mailback questionnaire

(4) For "Totals" only, divide "Useable Mailbacks" by "Mailbacks Distributed" (e.g.,  $683/1088=63\%$ ). For others, apply appropriate percentages to "Totals" column (e.g.,  $38.3\%$  Winter Response Rate  $= (0.053 \times 683) / (0.086 \times 1088)$ ).

(5) Detailed records regarding postcard and certified reminders were kept by season only; thus, corresponding %'s are missing from the regional distribution.

Some variations in response rates were observed across seasons, regions and population subgroups (Tables 1 and 2). Response rates during winter and spring seasons were below average (38% and 46%, respectively), while response rates for summer and fall seasons were above average (66% and 85%, respectively). Response rates were slightly below average in the Rock Island and St. Louis Districts (59% each). The response rate for sightseers was 70%. In terms of population subgroups (Table 2), response rates were lower for day users (61%), nonboaters (58%), and campers (57%), and higher for boaters (67%) and other overnight visitors (74%). Residents and nonresidents displayed response rates that were nearly identical to the overall response rate.

Due to some differences between segments in response rates to the mail-back questionnaire, overnight visitors and boaters are slightly overrepresented in the mailback sample (Table 2). This bias is corrected in estimates of trip spending by weighing the sample according to the segment shares in the on-site sample.

#### Visitor Segments

The calculation of total economic impacts requires the multiplication of three entities: total number of visitors by segment (V), spending by segment (S), and a multiplier (M) (Tyrrell 1985):

$$TEI = V \times S \times M$$

TEI = Total Economic Impact (income or jobs, usually)

V = number of visitors in a given segment, where segments are defined according to similarity in spending patterns (nonresident boaters,

campers, people just visiting for the day, overnight visitors, festival attendees, etc.)

S = average spending by each of these groups

M = a multiplier expressing the change in the amount of employment or income per unit of spending.

Errors in any of the multiplicands can cause large errors in total economic impacts.

In order to reduce the amount of variation in expenditure estimates, it is useful to segment visitors into subgroups that are relatively homogeneous with respect to their spending patterns (Stynes and Chung 1986, Tyrrell 1985, Propst et al. 1991). Due to the integral relationship between visitation and

Table 2. Mailback questionnaire response rates by visitor segmentation variable. UMRS study (1989-90).

Visitor Categories	Total Interviews N	Agreement PC	Interviews N	Mailback PCT.	Response Rate
Day users	1040	79%	849	75%	61%
Campers	51	4%	46	4%	57%
Other overnight	225	17%	193	21%	74%
UMRS Residents	969	74%	797	74%	63%
UMRS Nonresidents	347	26%	291	26%	62%
Boaters	666	51%	563	56%	67%
Nonboaters	650	49%	525	44%	58%
Total	1316		1088		63%

NOTES:

1. "Agreement Interviews" = On-site interviewees who also agreed to participate mailback portion of the study.
2. Response rate = "Mailback N" / "Interviews N."

spending in deriving total impacts, visitor spending segments were defined consistently with the way in which the Corps defines visitor use segments: boater vs. nonboater and day user vs. camper vs. other overnight accommodation user. The category "other overnight" includes overnight visitors who lodged either (a) in rented accommodations (hotels, etc.); (b) with family, friends, or in a second home; or (c) on a boat.

Furthermore, in order to separate spending by local residents from spending by tourists, it is necessary to know if the visitor is a resident or nonresident of the region of interest. In most economic impact analyses, spending within the region by visitors from outside the region (i.e., nonresidents) is used to derive  $S$  in the above equation. Spending by residents of a given region is excluded for economic impact purposes, but may be used to estimate total spending (Propst and Styne 1988). Combining the user/activity matrix with visitor origin yields the preliminary set of 18 segments identified in Table 3.

Reduction of Visitor Segments. Similar to the findings of Propst et al. (1991), the number and proportion of sampled overnight parties who lodged either with friends or relatives, or on a boat were relatively minor. Because of small samples for these segments, the three overnight noncamping segments were merged into one group for reporting purposes. This merger results in a reduction from the 18 segments in Table 3 to the following 12 segments which were employed in the national study:

R/D/B: resident, day use boater  
R/D/NB: resident, day use nonboater  
R/O/B: resident, overnight boater  
R/O/NB: resident, overnight nonboater  
R/C/B: resident, camper, boater  
R/C/NB: resident, camper, nonboater  
  
NR/D/B: nonresident, day use boater  
NR/D/NB: nonresident, day use nonboater  
NR/O/B: nonresident, overnight boater  
NR/O/NB: nonresident, overnight nonboater  
NR/C/B: nonresident, camper, boater  
NR/C/NB: nonresident, camper, nonboater

These 12 segments are defined in terms of four dichotomous variables: day use/overnight, resident/nonresident, camper/noncamper, boater/nonboater. The proportions of each of these visitor subgroups were provided in Table 2.

Table 3. Corps of Engineers visitor segments judged to be homogeneous with respect to their spending patterns, UMRS study (1989-90).

<u>Segment</u>	<u># Overnight</u>	<u>Boater</u>	<u>Resident</u>	<u>Type of Lodging</u>
1	day	yes	yes	--
2	day	yes	no	--
3	overnight	yes	yes	campground
4	overnight	yes	yes	rented accommodations
5*	overnight	yes	yes	friends/relatives/2nd home
6*	overnight	yes	yes	boat
7	overnight	yes	no	campground
8	overnight	yes	no	rented accommodations
9*	overnight	yes	no	friends/relatives/2nd home
10*	overnight	yes	no	boat
11	day	no	yes	--
12	day	no	no	--
13	overnight	no	yes	campground
14	overnight	no	yes	rented accommodations
15*	overnight	no	yes	friends/relatives/2nd home
16	overnight	no	no	campground
17	overnight	no	no	rented accommodations
18*	overnight	no	no	friends/relatives/2nd home

\* In the national study (Propst et. al 1992), these 6 segments were merged into an "other overnight" category due to inadequate sample sizes. Since the same pattern held in this study (i.e., small sample sizes in these 6 segments), the same segments were again merged for further analyses. Subsequent analyses, where possible, are therefore based on 12 visitor segments.



An important difference between the national study and this one is the definition of "resident." Here a resident is someone who lives within the counties that define the UMRS region, not a local area defined by a 30 mile radius of the site where a subject was interviewed.

The full sample in this study (on-site portion) was dominated by day users (79% of parties) as compared to campers (4%) and other overnight, non-camping parties (17%). There was a preponderance of residents over nonresidents (74% vs 26%, respectively). Boaters and nonboaters were evenly divided. Only minor variations in these proportions are observed in the mailback portion of the study (Table 2).

The top half of Table 4 shows the number and proportion of cases in each of the 12 segments for both the on-site and mailback portions of the study. Dividing the sample into 12 segments yields some segments with relatively low sample sizes. For example, none of the four camping segments contain sample sizes greater than 23. The two resident, overnight segments contain less than 40 cases each. Corresponding sample sizes for the mailback portion of the survey, which were used to estimate trip spending, are even smaller. To be able to analyze and report results by visitor segment with some degree of confidence, the 12 visitor segments described above were therefore narrowed into 6 segments. The segment definitions follow with the number of cases and segment shares for each segment in parentheses.

R/D/B: resident, day use boater (N=480, 36%)

R/D/NB: resident, day use nonboater (N=405, 31%)

R/OVN: resident, overnight visitors (N=84, 6%)

NR/D/B: nonresident, day use boater (N=60, 5%)

NR/D/NB: nonresident, day use nonboater (N=95, 7%)

NR/OVN: nonresident, overnight visitors (N=192, 15%)

To make this reduction, the four overnight segments (campers and non-campers) were combined into "resident, overnight" and "nonresident, overnight" categories. The resident/nonresident split was maintained as this separation is necessary to distinguish resident and nonresident spending for economic impact analysis. The four day use segments were not altered. The bottom half of Table 4 displays sample sizes and proportions based on the 6 aggregated segments. This reconfiguration of segments results in the ability to analyze and report results by segment based on no less than 60 cases for variables gathered in the on-site survey and no less than 30 cases for trip spending estimates from the mailback survey. The smallest sample size (N=60) is for

Table 4. On-site interview and mailback questionnaire sample sizes by 12 segments and 6 segments. UMRS study (1989-90).

12 Segments	on-site		mailback	
	N	Pct.	N	Pct.
R/D/B	480	36%	260	38%
R/D/NB	405	31%	185	27%
R/O/B	39	3%	33	5%
R/O/NB	23	2%	13	2%
R/C/B	9	1%	6	1%
R/C/NB	13	1%	6	1%
UMRS Residents	969	74%	503	74%
NR/D/B	60	5%	30	4%
NR/D/NB	95	7%	39	6%
NR/O/B	72	5%	47	7%
NR/O/NB	91	7%	50	7%
NR/C/B	6	0%	4	1%
NR/C/NB	23	2%	10	1%
UMRS Nonreside	347	26%	180	26%
Total	1316	100%	683	100%

6 Segments	on-site		mailback	
	N	Pct.	N	Pct.
R/D/B	480	36%	260	38%
R/D/NB	405	31%	185	27%
R/OVN	84	6%	58	8%
UMRS Residents	969	74%	503	74%
NR/D/B	60	5%	30	4%
NR/D/NB	95	7%	39	6%
NR/OVN	192	15%	111	16%
UMRS Nonreside	347	26%	180	26%
Total	1316	100%	683	100%

R/NR: Resident /Nonresident of the UMRS

B/NB: Boater /Nonboater

D/C/O: Day users /Campers / Other overnight users

OVN: All overnight users

nonresident, day users who engage in boating. The largest (41-46%) is for resident, day use boaters.

The on-site segment percentages (lower half of Table 4) provide estimates of the segment shares for the entire population of UMRS visitors. These on-site percentages are used in subsequent trip-related spending tables to adjust for nonresponse bias in the mailback questionnaire sample. Adjustments are not necessary for durable goods analyses as these data were gathered on-site from the full sample.

Regional Segment Distributions. Regional variations in the distribution of the six aggregated segments within the sample are documented in Tables 5 and 6. Appendix Table C-1 provides the distribution of the 12 segments by region for both the mailback questionnaires and on-site interviews.

Among residents, the largest proportions of day use boaters (55% and 54%, respectively) were found in the St. Louis District and Illinois River Waterway (Table 6). The greatest percentages of resident nonboaters were found in the Rock Island District (46%) and among sightseers (33%). For the St. Paul District visitors and the sightseer category, nonresident overnight visitors comprised over one fourth of the parties sampled, a significantly higher proportion than found in the other regions.

In general, the data in Table 5 further confirm the relatively close correspondence between mailback and on-site interview percentages. However, there are two exceptions. First, across the four regions, there is a pattern of higher percentages of boaters returning their mailback questionnaires than the corresponding percentages of boaters who were interviewed on-site. The reverse is true for sightseers who were also boaters (22% interviewed on site; 19% returned mailback questionnaires). Secondly, the percentage of Illinois River overnight visitors who returned their mailback questionnaires (14%) is more than twice the percentage of Illinois River overnight visitors who participated in the on-site interview (6%).

#### **Nights Spent per Trip**

A total of 1,404 nights were spent on all trips reported by the 247 overnight parties (Table 7). Fifty-four percent (54%) of all nights were spent within 30 miles of the interview site, 13% within the UMRS but further than 30 miles from the site, and 33% outside the UMRS. Overnight visitors

Table 5. Sample distribution by the four segmentation variables, UMRS study (1989-90).

Region	On-site					All overnight (Campers)	(Other overnight)	Sample size
	Boaters	Non- boaters	UMRS Resident	UMRS resident	Day users			
St. Paul	74%	26%	62%	38%	64%	36%	(6%)	311
Rock Island	39%	61%	83%	17%	85%	15%	(6%)	343
St. Louis	60%	40%	88%	12%	92%	8%	(1%)	231
IL. River	62%	38%	86%	14%	94%	6%	(1%)	138
Sightseers	68%	32%	56%	44%	68%	32%	(2%)	266
Total	50%	50%	73%	27%	79%	21%	(4%)	1289*

Region	Mailback					All overnight (Campers)	(Other overnight)	Sample size
	Boaters	Non- boaters	UMRS Resident	UMRS resident	Day users			
St. Paul	84%	16%	61%	39%	59%	41%	(5%)	162
Rock Island	47%	53%	84%	16%	83%	17%	(7%)	195
St. Louis	64%	36%	91%	9%	95%	5%	(0%)	116
IL. River	73%	27%	83%	17%	86%	14%	(3%)	66
Sightseers	19%	81%	53%	47%	61%	39%	(1%)	131
Total	56%	44%	74%	26%	75%	25%	(4%)	670**

( ): "Camper" and "Other Overnight" percentages sum to corresponding "All Overnight" percentages.

\* On-site interviews had 27 missing segment identifiers (1,289+27=1,316)

\*\* Mailback questionnaires had 13 missing segment identifiers (670+13=683)

Table 6. Distribution of six visitor segments by five regions (UMRS survey 1989-90): On-site surveys

	Region											
	St. Paul	Rock Island	St. Louis	IL. River	Sightseers	Total						
	N	PCT	N	PCT	N	PCT	N	PCT	N	PCT	N	PCT
Segment												
R/D/B	118	38%	97	28%	128	55%	75	54%	49	18%	467	36%
R/D/NB	42	14%	158	46%	68	29%	40	29%	88	33%	396	31%
R/OVN	32	10%	28	8%	7	3%	3	2%	13	5%	83	6%
UMRS Resid	192	62%	283	83%	203	88%	118	86%	150	56%	946	73%
NR/D/B	32	10%	15	4%	4	2%	4	3%	3	1%	58	4%
NR/D/NB	9	3%	22	6%	13	6%	11	8%	40	15%	95	7%
NR/OVN	78	25%	23	7%	11	5%	5	4%	73	27%	190	15%
Nonresiden	119	38%	60	17%	28	12%	20	14%	116	44%	343	27%
N	311	100%	343	100%	231	100%	138	100%	266	100%	1,289*	100%
Pct.	24%		27%		18%		11%		21%		100%	

R/NR: Resident /Nonresident of the UMRS

B/NB: Boater /Nonboater

D/OVN: Day users /Overnight users

\* On-site interviews had 27 missing segment identifiers (1289+27=1316)

spent an average of 5.7 nights per trip for overnight parties (75% confidence interval = 4.0 to 7.5 nights). The average trip length for residents was 4.3 nights compared to 6.7 nights for nonresidents.

Residents spent fewer nights per trip than nonresidents and most nights spent by UMRS residents were spent within 30 miles of the interview site (Table 7). Very few nights were spent either outside the UMRS or within the UMRS but farther than 30 miles from the site. It is still possible that UMRS resident overnight groups travel substantial distances along the river in one day to reach their destination and then spend most of their nights near the site.

### **Trip Expenditures**

Across the 1-year sampling period, the 683 parties who returned their mailback questionnaires averaged \$72 in variable costs per trip (Table 8). Sixty-eight percent of these expenditures were made within 30 miles of the project. Trip spending means were weighted by the proportions of the six segments in the on-site sample (lower half of Table 4) to adjust for non-response bias.

**Trip Spending by Segment.** Given that segments were formed to obtain subgroups with relatively homogeneous spending patterns, we find considerable variation in trip spending across the six segments. Trip spending varied from an average of \$22 per trip for resident, day users who do not boat to around \$200 per trip for the two overnight segments (see "Total" columns in Table 9A).

All six segments spent more than half of variable trip purchases within 30 miles of the interview site. Day users not boating spent the least on trip-related goods and services. Resident day users (boaters and nonboaters) made the largest portion of their variable trip purchases within the local region (89% and 75%, respectively). Nonresident, day users who boat and non-resident overnight groups also spent relatively large proportions within the local region (66% and 62%, respectively).

Appendix Tables C-2 and C-3 report trip spending profiles for the 12 visitor segments defined in the national study (Propst et al. 1992). Table C-2 displays total trip spending; Table C-3 shows spending by all 12 segments within 30 miles of the interview site. Small sample sizes for some segments (e.g.,  $n = 6$  for the nonresident, campers who boat segment) suggest caution in the use of some of these more detailed segments.

Table 7. Nights spent per trip by location, UMRS study (1989-90): Overnight parties only (n=247).

Location	Total Nights Spent	Pct. of Total Nights	N of Cases	Mean per trip*	Std. Error**	Median
Within 30 miles of interview site						
a. UMRS Residents	259	18%	67	3.87	1.44	2.0
b. UMRS Nonresidents	495	36%	178	2.78	0.38	2.0
c. Subtotal	754	54%	245	3.08	0.48	2.0
Within UMRS but outside 30 miles of interview site						
a. UMRS Residents	14	1%	33	0.42	0.17	0.0
b. UMRS Nonresidents	167	12%	109	1.53	0.49	0.0
c. Subtotal	181	13%	142	1.28	0.38	0.0
Outside UMRS						
a. UMRS Residents	16	1%	33	0.49	0.29	0.0
b. UMRS Nonresidents	453	32%	106	4.27	1.27	0.0
c. Subtotal	469	33%	139	3.25	1.00	0.0
All Nights						
a. UMRS Residents	275	20%	67	4.31	1.43	2.0
b. UMRS Nonresidents	1,129	80%	180	6.66	1.05	2.5
GRAND TOTAL	1,404	100%	247	5.68	0.86	2.0

\* Means for overnight parties derived by dividing "Total Nights Spent" by "N of Cases". Can be less than one when number of nights spent either within or outside the UMRS is less than number of cases. For example, 33 UMRS resident parties reported spending 16 nights outside the UMRS ( $16/33=0.49$ ). These same 33 parties also spent some nights within the UMRS. The combined number of nights spent both outside and inside the UMRS always exceeds the number of parties and hence cannot be less than zero.

\*\* Two standard errors yield a 95% confidence interval

Table 8A. Average trip spending (\$ per party per trip) for 33 detailed mallback expenditure items, UMRS study (1989-90), n=681.

	Within 30 Mi.		Outside 30 Mi.			Pct. Item	Pct.	Mean
Item	Mean	Pct.	Mean	Pct.	Total	In Total	Zeros	Exc. zeros
LODGING								
Hotel	4.40	58%	3.16	42%	7.56	10%	91%	96.10
Campgrounds	1.15	78%	0.33	22%	1.48	2%	95%	33.82
FOOD AND BEVERAGE								
Grocery	8.18	71%	3.33	29%	11.51	16%	52%	26.31
Restaurant	8.37	68%	3.92	32%	12.29	17%	64%	37.83
AUTO/RV								
Auto/RV gas & oil	7.11	58%	5.12	42%	12.23	17%	38%	21.17
Auto/RV rental	0.25	34%	0.48	66%	0.73	1%	99%	129.40
Auto/RV repairs	0.44	92%	0.04	8%	0.48	1%	96%	14.33
Auto/RV tires	0.85	83%	0.18	17%	1.03	1%	99%	95.88
Auto/RV parts	0.28	92%	0.02	8%	0.30	*	99%	33.57
Auto/RV parking & tolls	0.12	60%	0.08	40%	0.20	*	95%	4.62
BOAT-RELATED								
Boat gas & oil	4.90	84%	0.96	16%	5.86	8%	56%	15.45
Boat rental	0.08	82%	0.02	18%	0.10	*	99%	45.00
Boat repairs	0.91	91%	0.09	9%	1.00	1%	98%	57.20
Boat parts	1.81	83%	0.36	17%	2.17	3%	97%	78.62
Boat launch fees	0.89	77%	0.27	23%	1.16	2%	96%	32.96
Boat fares	0.00	0%	0.06	100%	0.06	*	99%	18.50
FISHING								
Fishing license	0.41	85%	0.07	15%	0.48	1%	98%	20.88
Boat charter fee	0.01	73%	0.00	27%	0.01	*	99%	5.00
Fishing bait	1.57	89%	0.18	11%	1.75	2%	71%	6.52
HUNTING								
Hunting license	0.13	90%	0.02	10%	0.15	*	99%	17.83
Ammunition	0.32	59%	0.23	41%	0.55	1%	97%	17.13
ACTIVITY FEES								
Equipment rental	0.25	85%	0.05	15%	0.30	*	99%	22.50
Guide fees	0.04	33%	0.07	67%	0.11	*	99%	33.33
Spectator sports fee	0.04	35%	0.07	65%	0.11	*	99%	16.67
Tourist attraction fee	0.12	19%	0.52	81%	0.64	1%	97%	22.18
Other recreation fee	0.16	39%	0.24	61%	0.40	1%	98%	23.38
MISCELLANEOUS								
Film purchase	0.86	62%	0.53	38%	1.39	2%	86%	10.95
Film developing	0.40	48%	0.44	52%	0.84	1%	92%	12.13
Souvenirs	1.17	61%	0.75	39%	1.92	3%	94%	34.20
Footwear	0.86	80%	0.21	20%	1.07	1%	97%	44.28
Men's clothing	1.07	96%	0.04	4%	1.11	2%	96%	34.04
Women's clothing	1.53	79%	0.39	21%	1.92	3%	95%	44.65
All other	0.78	49%	0.80	51%	1.58	2%	95%	33.00

Note: Means have been corrected for nonresponse bias by weighing by the proportions of visitor segments contained in the full (on-site) sample.

(\*) = less than 0.5%.



Table 8b. Average trip spending (\$ per party per trip) for 8 aggregate spending categories, UMRS study (1989-90), n=681.

Item	Within 30 Mi.		Outside 30 Mi.		Pct. Item Total	Pct. In Total	Mean	
	Mean	Pct.	Mean	Pct.			Zeros	Exc. zero
Lodging	5.56	61%	3.48	39%	9.04	12%	87%	80.04
Food & beverage	16.55	70%	7.25	30%	23.80	33%	41%	44.48
Auto/RV	9.05	60%	5.92	40%	14.97	21%	37%	26.05
Boat	8.59	83%	1.76	17%	10.35	14%	55%	26.78
Fishing	1.98	88%	0.26	12%	2.24	3%	70%	8.02
Hunting	0.46	65%	0.24	35%	0.70	1%	96%	19.27
Activity Fees	0.61	39%	0.95	61%	1.56	2%	94%	30.42
Miscellaneous	5.88	71%	2.37	29%	8.25	11%	80%	45.56
Total	49.45	68%	23.02	32%	72.47	100%	18%	98.25

Note: Means have been corrected for nonresponse bias by weighing by the proportions of visitor segments contained in the full (on-site) sample.

Table 9A. Average trip spending (\$ per party per trip) by six visitor segments for 33 detailed mailback expenditure items and item subtotals, UMRS study (1989-90).

Item	RD/B (n=259)			RD/NB (n=185)			R/OVN (n=58)			NR/D/B (n=30)			NR/D/NB (n=39)			NR/OVN (n=110)		
	In 30	Out 30	Total	In 30	Out 30	Total	In 30	Out 30	Total	In 30	Out 30	Total	In 30	Out 30	Total	In 30	Out 30	Total
Hotel	0.00	0.00	0.00	0.00	0.00	0.00	15.09	14.13	29.22	0.00	0.00	0.00	0.00	0.00	0.00	24.71	14.92	39.63
Campgrounds	0.00	0.00	0.00	0.00	0.00	0.00	7.36	2.31	9.67	0.00	0.00	0.00	0.00	0.00	0.00	4.35	1.00	5.35
Grocery	7.46	1.28	8.74	3.70	0.83	4.53	19.02	10.84	29.86	7.13	3.00	10.13	5.03	1.64	6.67	17.54	11.61	29.15
Restaurant	4.69	0.84	5.53	4.03	1.28	5.31	18.91	14.52	33.43	4.50	1.83	6.33	4.90	5.83	10.78	26.45	12.34	38.79
Auto/RV gas & oil	6.69	1.93	8.62	3.75	1.35	5.10	15.52	13.17	28.69	8.90	7.27	16.17	2.69	5.46	8.15	13.35	16.78	30.11
Auto/RV rental	0.10	0.04	0.14	0.00	0.00	0.00	0.00	6.24	6.24	0.00	0.00	0.00	0.00	0.00	0.00	1.36	0.91	2.27
Auto/RV repairs	0.59	0.00	0.59	0.03	0.00	0.03	3.05	0.62	3.67	0.00	0.00	0.00	0.08	0.00	0.08	0.06	0.05	0.11
Auto/RV tires	1.96	0.00	1.96	0.00	0.00	0.00	1.81	2.67	4.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto/RV parts	0.68	0.00	0.68	0.00	0.00	0.00	0.53	0.47	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto/RV parking & tolls	0.14	0.01	0.15	0.08	0.00	0.08	0.33	0.70	1.03	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.25	0.40
Boat gas & oil	8.50	0.84	9.34	0.00	0.00	0.00	9.66	6.00	15.66	7.97	1.46	9.43	0.00	0.00	0.00	7.17	2.16	9.33
Boat rental	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.64
Boat repairs	1.37	0.00	1.37	0.00	0.00	0.00	5.52	0.69	6.21	1.10	0.00	1.10	0.00	0.00	0.00	0.55	0.45	1.00
Boat parts	4.06	0.19	4.25	0.00	0.00	0.00	1.03	0.26	1.29	0.00	0.00	0.00	0.00	0.00	0.00	2.13	2.18	4.31
Boat launch fees	1.56	0.06	1.62	0.00	0.00	0.00	0.52	0.51	1.03	0.00	0.00	0.00	0.00	0.00	0.00	2.27	1.76	4.03
Boat fares	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.23	1.23	0.00	0.00	0.00	0.00	0.00	0.00
Fishing license	0.82	0.20	1.02	0.08	0.00	0.08	0.24	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.55
Boat charter fee	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fishing bait	1.78	0.19	1.97	0.99	0.05	1.04	2.57	0.19	2.76	1.63	0.34	1.97	0.79	0.29	1.08	2.54	0.37	2.91
Hunting license	0.05	0.00	0.05	0.29	0.00	0.29	0.17	0.26	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.15
Ammunition	0.72	0.23	0.95	0.00	0.00	0.00	0.14	0.00	0.14	0.40	0.00	0.40	0.00	0.92	0.92	0.27	0.58	0.85
Equipment rental	0.14	0.00	0.14	0.24	0.00	0.24	0.12	0.31	0.43	0.00	0.00	0.00	0.00	0.13	0.13	0.91	0.14	1.05
Guide fees	0.00	0.00	0.00	0.00	0.00	0.00	0.69	1.03	1.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spectator sports fee	0.00	0.00	0.00	0.00	0.09	0.09	0.09	0.69	1.38	0.00	0.00	0.00	0.00	0.05	0.05	0.02	0.00	0.02
Tourist attraction fee	0.04	0.00	0.04	0.10	0.05	0.15	0.09	2.29	2.38	0.00	0.00	0.00	0.00	0.00	0.00	0.45	2.37	2.82
Other recreation fee	0.12	0.00	0.12	0.03	0.00	0.03	0.53	1.19	1.72	0.00	0.00	0.00	0.00	1.85	1.85	0.55	0.33	0.88
Film purchase	1.19	0.13	1.32	0.40	0.39	0.79	1.24	3.10	4.34	0.23	0.27	0.50	0.41	0.00	0.41	1.34	1.10	2.44
Film developing	0.60	0.24	0.84	0.24	0.12	0.36	0.67	2.57	3.24	0.00	0.30	0.30	0.18	0.00	0.18	0.41	0.99	1.40
Souvenirs	0.21	0.08	0.29	0.82	0.00	0.82	0.97	5.22	6.19	0.00	0.00	0.00	0.00	0.00	0.00	5.18	2.25	7.43
Footwear	1.78	0.00	1.78	0.19	0.06	0.25	0.57	2.27	2.84	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.19	1.12
Men's clothing	1.33	0.00	1.33	0.00	0.00	0.00	2.10	0.74	2.84	0.00	0.00	0.00	0.90	0.00	0.90	3.09	0.00	3.09
Women's clothing	1.83	0.07	1.90	0.71	0.27	0.98	1.53	3.35	4.88	0.00	0.00	0.00	1.54	0.00	1.54	3.20	0.14	3.34
All Other	0.37	0.00	0.37	0.91	1.05	1.96	2.34	1.13	3.47	0.00	0.73	0.73	0.00	0.00	0.00	1.58	2.41	3.99
Total	48.80	6.33	55.13	16.59	5.56	22.15	113.02	97.84	210.86	31.87	16.43	48.30	16.56	16.23	32.79	121.88	75.26	197.14
Pct within 30 miles	89%			75%			54%			66%			51%			62%		

Handling of Zeros. Among the 683 parties who returned mailback questionnaires, more than 90% reported no spending in many of the 33 detailed spending categories (Table 8). Categories in which large percentages of visitors did not make expenditures were: auto/RV gas and oil (38%), grocery (52%), boat gas and oil (56%), restaurant (64%), fishing bait (71%), and film purchase (86%). Eighteen percent (18%) of the full sample reported no spending at all for the entire trip.

Estimates of average trip expenditures in all tables are based on the full sample, including parties who spent nothing on a given item. The mailback expense questionnaire (Appendix B) was designed to distinguish between those who actually spent nothing on a particular item and those who intentionally or unintentionally left a response blank. The mean including zeros is the appropriate statistic to multiply times total visitation to estimate total trip spending. Thus, spending means for the full sample, including zeroes, are reported. Table 8 also reports the percentages of visitors who did not spend money in a given category, along with the average expenses for those who spent money (i.e. omitting the zeros). The means without zeros should not be used to expand the data to population totals.

Trip Spending by Category. Table 8 shows the distribution of the \$72 per trip average across 33 specific trip expense categories and eight subtotals. Among the subtotals, the largest proportion of spending was for food and beverages (33%), followed by auto and RV (21%), boat (14%), lodging (12%), and miscellaneous items (film, souvenirs, footwear, clothing--11%). Fishing, hunting, and activity fees accounted for the remaining 6% of total trip spending. Spending for trip-related hunting goods and services accounted for only 1% of the total (the bulk of the interviews were conducted primarily in nonhunting seasons).

Table 9A reports the detailed trip spending profiles by segment and 33 spending categories. Spending is summarized within 8 aggregated categories in Table 9B. Variations in trip spending profiles across segments confirm the hypotheses on which our segmentation is based. That is, we expect overnight segments to spend more on lodging, boaters to spend more on boating-related items, and nonresidents to spend more in all categories. Day users not boating spend relatively high proportions of their total trip expenses on food and beverages (44% for residents and 53% for nonresidents). Day users who boat

Table 98. Average trip spending for item subtotals (\$ per party per trip).

Item	R/D/B (n=259)					R/D/NB (n=185)				
	In 30	Out 30	Total	% Item in Total	Pct. Error	In 30	Out 30	Total	% Item in Total	Pct. Error
Lodging	0.00	0.00	0.00	0%	0%	0.00	0.00	0.00	0%	0%
Food and beverage	12.15	2.12	14.27	26%	11%	7.73	2.11	9.84	44%	14%
Auto and RV	10.16	1.98	12.14	22%	22%	3.86	1.36	5.22	24%	16%
Boat	15.49	1.10	16.59	30%	21%	0.00	0.00	0.00	0%	0%
Fishing	2.63	0.39	3.02	5%	27%	1.07	0.05	1.12	5%	21%
Hunting	0.76	0.23	0.99	2%	27%	0.29	0.00	0.29	1%	100%
Activity Fees	0.29	0.00	0.29	1%	48%	0.00	0.51	0.51	2%	57%
Miscellaneous	6.94	0.53	7.47	14%	36%	2.36	0.85	3.21	14%	36%
Total	48.80	6.33	55.13	100%	13%	16.59	5.56	22.15	100%	14%

Item	NR/D/B (n=30)					NR/D/NB (n=39)				
	In 30	Out 30	Total	% Item in Total	Pct. Error	In 30	Out 30	Total	% Item in Total	Pct. Error
Lodging	0.00	0.00	0.00	0%	0%	0.00	0.00	0.00	0%	0%
Food and beverage	11.63	4.84	16.47	34%	30%	9.92	7.54	17.46	53%	25%
Auto and RV	8.90	7.27	16.17	33%	20%	2.77	5.46	8.23	25%	21%
Boat	9.07	2.70	11.77	24%	19%	0.00	0.00	0.00	0%	0%
Fishing	1.63	0.34	1.97	4%	31%	0.79	0.29	1.08	3%	54%
Hunting	0.40	0.00	0.40	1%	100%	0.00	0.92	0.92	3%	100%
Activity Fees	0.00	0.00	0.00	0%	0%	0.05	2.03	2.08	6%	89%
Miscellaneous	0.23	0.57	0.80	2%	52%	3.03	0.00	3.03	9%	57%
Total	31.87	16.43	48.30	100%	20%	16.56	16.23	32.79	100%	23%

Item	R/OVN (n=58)					NR/OVN (n=110)				
	In 30	Out 30	Total	% Item in Total	Pct. Error	In 30	Out 30	Total	% Item in Total	Pct. Error
Lodging	22.45	16.45	38.90	18%	25%	29.05	15.93	44.98	23%	15%
Food and beverage	37.93	25.36	63.29	30%	20%	43.99	23.96	67.95	34%	10%
Auto and RV	21.24	23.88	45.12	21%	30%	14.92	17.97	32.89	17%	12%
Boat	16.72	7.81	24.53	12%	37%	12.75	6.55	19.30	10%	24%
Fishing	2.81	0.19	3.00	1%	25%	3.09	0.37	3.46	2%	27%
Hunting	0.31	0.26	0.57	0%	70%	0.42	0.57	0.99	1%	56%
Activity Fees	2.12	5.52	7.64	4%	46%	1.93	2.83	4.76	2%	44%
Miscellaneous	7.09	17.25	24.34	12%	39%	14.15	4.66	18.81	10%	25%
Total	113.02	97.84	210.86	100%	24%	121.88	75.26	197.14	100%	9%

R/NR: Resident /Nonresident of UMRS

B/NB: Boater /Nonboater

D/OVN: Day users /Overnight users

Pct.Error: Standard error of the mean as a percentage of the mean. Two standard errors yield a 95% confidence interval.

divide their expenses more evenly among food and beverages, auto/RV and boat-related costs.

Variation Across Regions. Table 10 compares trip spending according to destination region (where party was interviewed). The four geographic regions contain sites on both banks of the river and thus do not correspond to state boundaries. Given that the river itself may confine expenditures to one side or the other, further analyses with different regional boundaries (e.g., by state) are recommended.

The most striking feature of Table 10 is that there is little consistency in spending profiles across regions. Average spending ranges from \$60 per trip in the Rock Island District to \$109 per trip in the St. Paul District. The proportion of spending within 30 miles of the interview site varies from 51% among sightseers to 85% in the Illinois River Waterway.

The Rock Island and St. Louis District profiles are the most similar, with the exception of lower proportions spent on lodging and food and a higher proportion spent on miscellaneous items in the St. Louis District. The St. Paul District and sightseer subgroup also display similar profiles except in lodging and boating expenses. Parties interviewed in the Illinois River Waterway reported, by far, the largest percentage of costs related to boating (39%). These groups also incurred the lowest proportion of lodging expenses (2%).

Comparisons by region alone do not necessarily account for the variations in spending profiles. Other factors may interact with regional influences. For example, differences in the percentages of visitors from each of the six segments account for some of the regional variation. The Rock Island, St. Louis, and Illinois River regions contained a much higher percentage of day users than the other two regions (see Table 5 and Appendix Table C-1). Day users have fewer trip-related expenses than overnight visitors. The St. Paul District and sightseers contained a relatively high proportion of nonresidents who were staying overnight. In addition, the St. Paul District sample included the largest ratio of boaters (84%). Due to the uncertainty concerning the extent to which regions may be influencing these variations, the full sample spending profiles (Table 8) may be more reliable than the regional sample estimates for assessing regional impacts.

Table 10. Average trip spending by region (dollars per party per trip), UMRS study (1989-90).

A. Within 30 miles									
Spending categories	St. Paul (n=162)	% Item in To	R. Island (n=195)	% Item in To	St. Louis (n=116)	% Item in To	IL. River (n=65)	% Item in To	Sightseers (n=130) % Item in Total
Lodging	12.63	15%	2.86	8%	0.73	1%	1.46	2%	12.38 25%
Food and beverage	30.24	36%	12.74	37%	11.42	22%	17.40	26%	17.93 37%
Auto and RV	10.12	12%	8.26	24%	13.76	27%	9.32	14%	8.21 17%
Boat	15.63	19%	5.73	17%	8.36	16%	25.91	39%	2.17 4%
Fishing	3.87	5%	1.85	5%	2.16	4%	1.32	2%	0.90 2%
Hunting	0.53	1%	0.27	1%	0.69	1%	1.11	2%	0.21 0%
Activity Fees	1.09	1%	0.58	2%	0.17	0%	1.31	2%	0.62 1%
Miscellaneous	8.06	10%	1.71	5%	13.72	27%	6.60	10%	5.06 10%
Total	83.13	100%	34.38	100%	51.58	100%	66.29	100%	48.72 100%
B. Total trip spending									
Lodging	15.18	14%	5.32	9%	2.46	4%	1.46	2%	24.78 26%
Food and beverage	39.20	36%	18.82	31%	16.41	25%	19.40	25%	33.95 36%
Auto and RV	17.24	16%	15.44	26%	17.17	26%	15.29	20%	17.08 18%
Boat	20.21	19%	8.47	14%	8.72	13%	28.37	36%	2.62 3%
Fishing	4.02	4%	2.38	4%	2.37	4%	1.55	2%	1.01 1%
Hunting	0.96	1%	0.62	1%	0.69	1%	1.11	1%	0.28 0%
Activity Fees	1.73	2%	1.87	3%	0.25	0%	1.31	2%	3.48 4%
Miscellaneous	9.44	9%	6.36	11%	14.68	23%	7.46	10%	9.01 9%
Total	109.12	100%	60.07	100%	64.85	100%	77.82	100%	95.43 100%
% Within 30 miles	76%		57%		80%		85%		51%

Note: Means are unweighted because sample sizes by segment at the regional level are too small to be considered reliable.

Resident vs. Nonresident Spending. Table 11 reports the distribution of trip spending by origin of visitor and location of spending. For this analysis, residents of the UMRS were divided into two subcategories: (1) local visitors living within 30 miles of the site (defined operationally as in the same county), and (2) UMRS residents living more than 30 miles from the site. Visitors from outside the UMRS region make up the third category based on visitor origins. Forty percent of visitors live within 30 miles of the site, a third (33%) live within the UMRS, but beyond 30 miles, and 26% reside outside the UMRS.

The location where the spending occurred is divided into two groups: (1) within 30 miles of the site, and (2) outside of 30 miles. A small portion of spending outside of 30 miles will still be within the UMRS region. About two thirds (68%) of trip spending occurred within 30 miles of the interview site and one-third was spent outside 30 miles. We cannot directly estimate how much of the spending outside of 30 miles is within the UMRS, but conservatively estimate that at least 85% of all trip spending by visitors to the UMRS occurred within the UMRS region.

To obtain the portions of total trip spending by residence and where the spending takes place, we begin with the distribution of spending on a typical trip for each segment (Step 1 in Table 11). The three segments must then be weighted according to the numbers of trips that each generates (40% by local residents, 33% by UMRS residents living beyond 30 miles, and 26% by nonresidents). This is done by generating total spending for a representative set of 1000 party trips in step 2. These figures are then converted to percentages in step 3.

Local residents account for about a third of all trip spending (32%), visitors from outside the UMRS contribute 44% of the total and other residents of the UMRS from beyond 30 miles make up the remaining 23%. Forty-three percent (43%) of all trip costs are spent locally by visitors from outside of the local area (includes UMRS residents from outside 30 miles and nonresidents of UMRS). About one fourth (24%) of local spending is by local residents.

Errors in Estimates of Trip Spending. Table 12 reports sampling errors associated with trip spending estimates. The "percent error" is the standard error divided by the mean and multiplied by 100. Presenting the standard error as a percentage aids in interpretation of variance. For example, Table 12B indicates, that for all 683 cases, the error associated with the

Table 11. Distribution of trip spending by segment and region.  
UMRS study (1989-90).

	Percent of trips	Spending Within UMRS	Spending Outside UMRS	Total Trip Spending
STEP 1: -----Dollars per party per trip-----				
Residents within 30	40%	48.78	16.08	64.86
UMRS Resident	34%	39.13	17.31	56.44
UMRS Nonresident	26%	83.85	52.54	136.39
Total	100%	49.45*	23.02*	72.47*
STEP 2: ---Trip Spending per 1,000 Party-Trips---				
Residents within 30 (400 tri	19,720	6,500	26,220	
UMRS Resident (240 trips)	13,024	5,761	18,785	
UMRS Nonresident (260 trips)	22,046	13,814	35,859	
Total (1000 trips)	54,789	26,075	80,864	
STEP 3: ---Percent of Total Trip Spending---				
Residents within 30	24%	8%	32%	
UMRS Resident	16%	7%	23%	
UMRS Nonresident	27%	17%	44%	
Total	68%	32%	100%	

NOTES:

1. (\*) Averages have been corrected for nonresponse bias by weighing by the proportion of visitor segments found in the full (on-site) sample.
2. Entries in step 2 obtained by multiplying per trip figures in step 1 by 400 trips (residents within 30 miles of site), 240 trips (other UMRS residents), and 260 trips (nonresidents of UMRS), respectively.
3. Percentages in step 3 obtained by dividing step 2 figures by the total (\$80,864).



Table 12A. Selected statistics for trip spending by detailed expenditure items, UMRS study (1989-90).

Item	Weighted	Std.	Pct	95% CI	
	Mean	Error	Error	Mean-	Mean+
Hotel	7.56	1.26	17%	5.03	10.09
Campgrounds	1.48	0.42	28%	0.64	2.32
Grocery	11.51	0.96	8%	9.60	13.42
Restaurant	12.29	1.11	9%	10.07	14.51
Auto/RV gas & oil	12.23	0.90	7%	10.43	14.03
Auto/RV rental	0.73	0.50	69%	(0)	1.73
Auto/RV repairs	0.48	0.23	47%	0.02	0.94
Auto/RV tires	1.03	0.51	49%	0.01	2.05
Auto/RV parts	0.30	0.21	70%	(0)	0.72
Auto/RV parking & tolls	0.20	0.05	27%	0.09	0.31
Boat gas & oil	5.86	0.60	10%	4.66	7.06
Boat rental	0.10	0.10	100%	(0)	0.30
Boat repairs	1.00	0.52	52%	(0)	2.04
Boat parts	2.17	0.86	39%	0.46	3.88
Boat launch fees	1.16	0.52	45%	0.12	2.20
Boat fares	0.06	0.04	61%	(0)	0.13
Fishing license	0.48	0.23	47%	0.02	0.94
Boat charter fee	0.01	0.01	91%	(0)	0.03
Fishing bait	1.75	0.22	12%	1.31	2.19
Hunting license	0.15	0.08	55%	(0)	0.31
Ammunition	0.55	0.13	23%	0.30	0.80
Equipment rental	0.30	0.13	42%	0.05	0.55
Guide fees	0.11	0.09	83%	(0)	0.29
Spectator sports fee	0.11	0.07	66%	(0)	0.26
Tourist attraction fee	0.64	0.27	43%	0.09	1.19
Other recreation fee	0.40	0.16	41%	0.07	0.73
Film purchase	1.39	0.25	18%	0.88	1.90
Film developing	0.84	0.18	22%	0.48	1.20
Souvenirs	1.92	0.56	29%	0.81	3.03
Footwear	1.07	0.33	31%	0.41	1.73
Men's clothing	1.11	0.34	30%	0.44	1.78
Women's clothing	1.92	0.44	23%	1.05	2.79
All other	1.58	0.44	28%	0.71	2.45
Total	72.47	5.99	8%	60.49	84.45

Pct. Error: Standard error of the mean as a percentage of the mean. Two standard errors yield a 95% confidence interval.

Table 12B. Selected statistics for trip spending by major subcategories and by segment.

By Major Category	Weighted	Std.	Pct.	95% CI	
	Mean	Error	Error	Mean-	Mean+
Lodging	9.04	1.37	15%	6.29	11.79
Food & beverage	23.80	1.76	7%	20.29	27.31
Auto and RV	14.97	1.59	11%	11.79	18.16
Boat	10.35	1.58	15%	7.18	13.52
Fishing	2.24	0.33	15%	1.58	2.90
Hunting	0.70	0.15	22%	0.39	1.01
Activity Fees	1.56	0.44	28%	0.69	2.43
Miscellaneous	8.25	1.44	17%	5.37	11.13
<u>By Segment</u>					
R/D/B	55.13	7.00	13%	41.13	69.13
R/D/NB	16.59	3.11	14%	10.37	22.81
R/OVN	210.86	51.24	24%	108.38	313.34
NR/D/B	48.30	9.51	20%	29.28	67.32
NR/D/NB	32.79	7.65	23%	17.49	48.09
NR/OVN	197.14	18.71	9%	159.72	234.56
Total	72.47	5.99	8%	60.49	84.45

hunting category mean is 3 times greater than the error associated with the food/beverage mean: 22% vs. 7%, respectively.

The standard error for the estimate of total trip spending is plus or minus 3 percent of the mean of \$72.47 per trip (Table 12A). The 95 percent confidence interval for the mean is two standard errors on either side of the mean. Thus, the 95 percent confidence interval for the overall trip spending estimate is between \$60.49 and \$84.45 per party per trip. The standard errors for trip spending estimates by segment range from 9 to 24 percent of the means (Table 12B).

The standard error of the mean decreases as sample size increases. For example, the highest percent errors for any of the 6 segments in Table 12B are 20%, 23%, and 24%. These percentages are associated with the segments with the smallest sample sizes (nonresident, day use boaters; nonresident, day use nonboaters; resident overnight visitors, respectively).

The standard error also reflects the dispersion of sample estimates about the mean in repeated samples. In Table 12B, for example, the 28% error for the average spending on activity fees results from a high variance in activity fee expenses.

#### **Durable Goods Spending**

During the 1-year study period, 59% of visiting parties brought one or more durable goods items with them on the sampled trip for use on the UMRS. Fifty-three percent (53%) brought one or more major durable goods items (Table 13, List 1) and 29% had brought one or more smaller durable items (Table 13, List 2). The propensity to bring durable goods varied with user segments, as expected. Ninety-four percent (94%) of day users who boated on the UMRS brought a durable goods item, compared with 19% of day users who did not boat. Sixty-two percent (62%) of overnight visitors brought a durable goods item, with those boating or camping most likely to bring durable equipment. UMRS residents were more likely than nonresidents to bring durable goods, largely due to a higher incidence of boating among residents (Table 14).

**Durable Goods Spending per Trip.** Within the past year, the average UMRS visitor spent the equivalent of \$56 per party per trip on durable items that were used for recreation on the UMRS; \$49 dollars per trip was spent for major durable goods and \$7 for smaller items. Of the \$56 in durable spending, \$28

Table 13. Durable goods equipment items and codes, EMRS Study (1989-90).

Used on this trip		Used on this trip and purchased within the last 12 months	
Equipment List No. 1	Code	Equipment List No. 2	Code
BOATING		BOATING	
Motorized Boat	10	Water skis and equipment	17
Nonmotorized boat	11	Boat accessories	18
Other boating	12		
Jet Ski	13	FISHING	
Sailboard	14		
Boat engines, outboard motors	15	Rods, reels, poles	20
Boat trailer	16	Seines, traps, and nets	21
Combination boat, motor, trailer	19	Depth and fish finders	22
		Fishing vests and other clothing	23
CAMPING		Rubber boots, waders	24
Motor home	40	Trolling motors	25
Travel trailer	41	Tackle, lures, flies	26
Pop-up trailer	42		
Pickup camper	43	HUNTING	
Converted van or bus	44		
Other camping	45	Rifles, shotguns, handguns, muzzleloaders	30
OTHER MOTORIZED VEHICLES		Bows, arrows and other archery equipment	31
Snowmobiles	50	Decoys	32
Trail bikes, scooters	51	Carriers and cases	33
3 or 4-wheelers	52	Hunting boots	34
Other vehicles	53	Rubber boots and waders	35
		Hunting clothing	36
OTHER EQUIPMENT		CAMPING	
Other trailers	60		
Other major equipment	61	Tents, sleeping bags, backpacks	46
		Camping vehicle accessories	47
		OTHER RECREATIONAL EQUIPMENT	
		Bicycles	62
		Other minor equipment	63

Notes: Equipment list no. 1 contains items that were purchased in any previous year and used on the current trip. Equipment list no. 2 contains items purchased within the last 12 months and used on the current trip. The durable goods equipment card, on which this table is based, is found in Appendix A.

Table 14. Percentage of UMRS visitors with durable goods equipment by segment

SEGMENT	N	LIST 1 PCT	LIST 2 PCT	EITHER PCT
R/D/B	480	94%	44%	95%
R/D/NB	405	6%	17%	20%
R/OVN	84	67%	29%	71%
UMRS Residents	969	55%	31%	61%
NR/D/B	60	93%	34%	92%
NR/D/NB	95	6%	15%	18%
NR/OVN	192	52%	20%	58%
Nonresidents	347	39%	33%	53%
TOTAL	1,316	53%	29%	59%

- a. List 1 includes all major durable goods brought on the trip for use on UMRS
- b. List 2 includes smaller durable goods purchased within the past year and used on the UMRS.

was for boating equipment, \$22 for camping vehicles, about \$5 for fishing gear, and about \$1 for everything else (Table 15).

About half (46%) of all durable goods spending (dollars spent) took place within the UMRS region. Of \$26 dollars per trip spent within the UMRS region, \$16 was spent on boating equipment, \$5 on camping vehicles, about \$4 for fishing gear, and less than \$1 for other items. The tendency of visitors to purchase durable goods within the UMRS varied across segments and durable items. By major category of equipment, 79% of all spending on fishing gear and 58% of spending on boating equipment was within the UMRS, while only 24% of spending on camping equipment occurred within the region (Table 16). UMRS residents were more likely than nonresidents to buy durable goods within the region. Sixty-eight percent (68%) of resident durable goods spending occurred within the UMRS as compared to 16% for nonresidents.

Durable Goods Spending by Segment. Durable goods spending, like trip spending, varied considerably by visitor segment. Nonresidents spent \$89 dollars per trip on durable goods as compared to \$44 for UMRS residents. Overnight visitors spent the largest amounts on durable goods, primarily due to large camping vehicle purchases. Boaters also reported significant durable goods purchases and account for the majority of all durable goods spending (Table 15).

The distribution of durable goods spending by visitor origin and where the spending takes place is summarized in Table 17. UMRS residents accounted for 58% of all durable goods spending. Just under half (46%) of all durable goods spending occurred within the UMRS region. For regional economic impact analysis the crucial spending is that of nonresidents within the UMRS. For durable goods, nonresident spending within the UMRS was only 7% of the total, or the equivalent of \$4 per party-trip.

Durable Goods Spending Estimates by Individual Items. The sample of 1,316 visitor parties reported 1,732 durable items or groups of items that were brought with them for use on the UMRS. About 60% of the items reported were major durable goods such as boats, engines, trailers, and recreational vehicles (Table 13, List 1), while 40% were fishing tackle, boating and camping accessories and other smaller items (Table 13, List 2). For smaller durable goods, only items purchased within the past year were recorded. About one fourth of major durable items (List 1) were bought within the past year, and

Table 15. Durable goods spending per party per trip by segment and major category of durables

SEGMENT	N	Total In UMRS Region	Pct Local	TOTAL SPENDING			SPENDING IN UMRS REGION							
				BOAT	CAMP	FISH	BOAT	CAMP	FISH	HUNT	OTHER			
				-----Dollars per party trip-----										
R/D/B	480	\$60.65	\$46.35	76%	47.74	1.94	9.31	0.82	0.84	35.44	1.64	8.01	0.53	0.73
R/D/NB	405	\$2.30	\$1.79	78%	0.32	0.58	1.12	0.16	0.12	0.23	0.50	0.96	0.01	0.08
R/OWN	84	\$120.65	\$73.79	61%	22.52	94.17	3.78	0.01	0.16	15.53	54.84	3.29	0.00	0.13
UMRS Residents	969	\$43.95	\$30.10	68%	28.22	9.37	5.41	0.47	0.48	19.00	5.78	4.65	0.27	0.41
NR/D/B	60	\$54.58	\$13.64	25%	49.61	0.65	4.00	0.01	0.31	11.09	0.52	1.78	0.01	0.24
NR/D/NB	95	\$1.39	\$0.59	42%	0.04	0.04	1.29	0.00	0.02	0.04	0.03	0.51	0.00	0.01
NR/OWN	192	\$138.83	\$21.37	15%	31.91	103.03	3.32	0.15	0.43	12.96	6.93	1.24	0.15	0.09
NONRESIDENTS	347	\$89.17	\$14.34	16%	28.78	57.13	2.88	0.09	0.29	9.10	3.93	1.13	0.08	0.10
TOTAL	1 316	\$55.87	\$25.95	46%	28.37	21.96	4.74	0.37	0.43	16.39	5.29	3.73	0.22	0.32

Table 16. Percent of durable goods expenditures occurring within UMRS region by segment and type

SEGMENT	Type of Durable Equipment					TOTAL
	BOAT	CAMP	FISH	HUNT	OTHER	
UMRS Residents						
R/D/B	74%	NR	86%	NR	NR	76%
R/D/NB	72%	NR	86%	NR	NR	78%
R/OVN	69%	58%	87%	NR	NR	61%
RESIDENT TOTAL	67%	62%	86%	NR	NR	68%
NonResidents						
NR/D/B	22%	NR	44%	NR	NR	25%
NR/D/NB	86%	NR	39%	NR	NR	42%
NR/OVN	41%	7%	37%	NR	NR	15%
NONRESIDENT TOTAL	32%	7%	39%	NR	NR	16%
TOTAL	58%	24%	79%	59%	76%	46%

NR - Estimate unreliable due to small samples.



Table 17. Distribution of durable goods spending by segment and region

	Percent of Trips	Spending Within UMRS	Spending Outside UMRS	Total Durable Spending
STEP 1: ----- Dollars per party per trip -----				
UMRS Resident	74%	30.10	13.85	43.95
Nonresident	26%	14.34	74.83	89.17
Total	100%	25.95	29.93	55.87
STEP 2: ----- Durable spending per 1,000 trips -----				
UMRS Resident (740 trips)		22,277	10,247	32,524
NonResident (260 trips)		3,729	19,455	23,185
Total (1000 trips)		26,006	29,702	55,708
STEP 3: ----- Percent of total durable spending -----				
UMRS Resident		40%	18%	58%
Nonresident		7%	35%	42%
Total		46%	54%	100%

- a. Entries in step 2 obtained by multiplying per trip figures in step 1 by 740 resident trips and 260 nonresident trips, respectively.
- b. Percentages in step 3 obtained by dividing step 2 figures by the total (\$55,708).

one half were purchased within the past 6 years. Boats, engines and trailers account for the preponderance of major durable goods. Fishing equipment constitutes the vast majority of smaller durable goods reported.

Spending reported by UMRS visitors on individual durable items is summarized in Table 18. The "Subgroup Percentages" in column 8 of this table were used to generate the detailed durable goods spending profiles in Tables 19A and 19B. Using all durable goods purchased within the past 6 years, we estimated the percentage of spending on each major category to be allocated to individual items within that category. For example, 58% of spending on fishing gear is allocated to "rods and reels" and 68% of camping expenses is allocated to "motorhomes." The subgroup percentages are calculated by multiplying the number of items purchased in the last 6 years by the average cost per item and then dividing each individual category by the subgroup total. The final column of Table 18 illustrates how these percentages are used to allocate subgroup spending totals to individual items. For example, the \$28.37 spent on boating equipment is distributed to the 10 kinds of boating items using the subgroup percentages.

The percentages for the full sample are used to develop the detailed profiles for both totals and individual segments. This avoids some of the problems associated with small sample sizes for some segments and individual durable items. The procedure allows the totals for subgroups of durable items (boating, camping, fishing, etc.) to vary across segments, while generating estimates for individual categories without excessive distortions that could be caused by small samples for particular segments and a few large expenses for individual durable items. The resulting detailed spending profiles for the six segments are reported in Table 19. Table 19A reports all durable goods spending and Table 19B reports durable goods spending within the UMRS.

Corresponding tables for the original 12 segments are included in Appendix C (Tables C-4, C-5, C-6 and C-7), but caution is urged in using results for segments with less than 50 cases. These detailed durable goods spending profiles can be bridged directly to IMPLAN sectors in the same way as the trip spending profiles.

Variations by Region. Direct estimates from the sample of durable goods spending at regional levels were deemed unreliable due to the usual small sample and high variance problems. We therefore used two indirect methods to estimate durable goods spending by region. The first approach estimates

Table 18. Spending on durable goods by type, JMRS visitors

CATEGORY	ALL ITEMS		ITEMS PURCHASED IN LAST 6 YEARS					
	N	\$ per Item	N	\$ per Item	Total Cos \$(000's)	Pct of Total	Pct of Subgroup	\$ per Party-trip
Motor boat	175	277.53	69	465.37	32.1	7.3%	14.0%	3.98
Non-Motor	24	190.38	10	83.75	0.8	0.2%	0.4%	0.10
Other boats	4	5.61	4	5.61	0.0	0.0%	0.0%	0.00
Jet ski	5	1,000.99	5	1,000.99	5.0	1.1%	2.2%	0.62
Sailboard	1	0.00	0	0.00	0.0	0.0%	0.0%	0.00
Boat engines	139	63.44	79	75.97	6.0	1.4%	2.6%	0.74
Boat trailer	146	49.23	88	36.14	3.2	0.7%	1.4%	0.39
Waterski	72	15.89	72	15.89	6.9	1.6%	3.0%	0.85
Boat accessories	97	11.75	96	11.86	6.8	1.6%	3.0%	0.85
Boat/engine/trailer comb.	431	599.55	202	830.68	167.8	38.2%	73.4%	20.82
BOAT TOTAL	1,094	306.09	625	365.84	228.6	52.1%	100%	28.37
Rods & reels	280	12.67	277	12.75	21.2	4.8%	58.4%	2.77
Nets, traps	33	11.13	33	11.13	2.2	0.5%	6.1%	0.29
Depth finders	61	13.41	60	13.63	4.9	1.1%	13.5%	0.64
Fishing clothing	61	3.72	61	3.72	1.4	0.3%	3.8%	0.18
Boots & waders	52	3.25	52	3.25	1.0	0.2%	2.8%	0.13
Trolling motors	49	18.97	49	18.97	5.6	1.3%	15.4%	0.73
FISH TOTAL	536	11.30	532	68.16	36.3	8.3%	100%	4.74
Rifles	8	51.49	8	51.49	2.5	0.6%	86.6%	0.32
Decoys	2	1.03	2	1.03	0.0	0.0%	0.4%	0.00
Carriers	1	0.20	1	0.20	0.0	0.0%	0.0%	0.00
Hunting boots	4	1.03	4	1.03	0.0	0.0%	0.9%	0.00
Rubber boots	2	0.59	2	0.59	0.0	0.0%	0.2%	0.00
Hunting clothing	8	6.99	8	6.99	0.3	0.1%	11.8%	0.04
HUNT TOTAL	25	19.02	25	114.10	2.9	0.6%	100%	0.37
Motor home	13	10,851.72	10	11,457.23	114.6	26.1%	68.0%	14.93
Travel trailer	25	2,213.79	13	3,008.38	39.1	8.9%	23.2%	5.10
Pop-up trailer	3	559.66	1	1,166.67	1.2	0.3%	0.7%	0.15
Pickup camper	3	566.67	1	0.00	0.0	0.0%	0.0%	0.00
Van/bus conversion	3	5,227.27	2	6,590.91	13.2	3.0%	7.8%	1.72
Ot. r camp	2	156.46	0	0.00	0.0	0.0%	0.0%	0.00
Tents	6	19.00	5	17.08	0.5	0.1%	0.3%	0.07
CAMP TOTAL	55	3,925.54	32	5,266.95	168.5	38.4%	100%	21.96
Other trailer	5	11.02	3	15.52	0.0	0.0%	1.6%	0.01
Other equip	4	12.69	4	12.69	0.1	0.0%	1.7%	0.01
Bikes	5	35.29	3	23.85	0.4	0.1%	14.8%	0.06
Other	8	49.52	8	49.52	2.4	0.5%	81.9%	0.35
OTHER TOTAL	22	30.84	18	161.32	2.9	0.7%	100%	0.43
ALL ITEMS TOTAL	1,732	322.16	1,232	318.53	439.2	100.0%		55.87

a. All expense variables expressed on a per trip basis.

b. List 2 items multiplied by six to obtain 6-year total.

Table 19A. Durable goods spending by segment and category (\$ per party-trip) -ALL SPENDING

CATEGORY	SEGMENTS						UMRS		Non-
	R/D/B	R/D/NB	RES/OVN	NR/D/B	NR/D/NB	NR/OVN	Resident	Residents	
Motor boat	6.70	0.05	3.16	6.97	0.01	4.48	3.96	4.04	3.98
NonMotorized boat	0.17	0.00	0.08	0.18	0.00	0.12	0.10	0.11	0.10
Other boats	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jet ski	1.05	0.01	0.49	1.09	0.00	0.70	0.62	0.63	0.62
Sailboard	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Boat engines	1.25	0.01	0.59	1.30	0.00	0.84	0.74	0.76	0.74
Boat trailer	0.66	0.00	0.31	0.69	0.00	0.44	0.39	0.40	0.39
Waterski	1.43	0.01	0.68	1.49	0.00	0.96	0.85	0.86	0.85
Boat accessories	1.43	0.01	0.67	1.48	0.00	0.95	0.84	0.86	0.85
Boat/engine/trailer c	35.04	0.24	16.52	36.41	0.03	23.42	20.71	21.12	20.82
Rods & reels	5.44	0.66	2.21	2.34	0.76	1.94	3.16	1.68	2.77
Nets, traps	0.57	0.07	0.23	0.24	0.08	0.20	0.33	0.18	0.29
Depth finders	1.26	0.15	0.51	0.54	0.18	0.45	0.73	0.39	0.64
Fishing clothing	0.35	0.04	0.14	0.15	0.05	0.12	0.20	0.11	0.18
Boots & waders	0.26	0.03	0.11	0.11	0.04	0.09	0.15	0.08	0.13
Trolling motors	1.43	0.17	0.58	0.62	0.20	0.51	0.83	0.44	0.73
Rifles	0.71	0.14	0.01	0.01	0.00	0.13	0.41	0.07	0.32
Decoys	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carriers and cases	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hunting boots	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber boots	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hunting clothing	0.10	0.02	0.00	0.00	0.00	0.02	0.06	0.01	0.04
Motor home	1.32	0.39	64.02	0.44	0.02	70.04	6.37	38.84	14.93
Travel trailer	0.45	0.13	21.85	0.15	0.01	23.91	2.17	13.26	5.10
Pop-up trailer	0.01	0.00	0.65	0.00	0.00	0.71	0.06	0.40	0.15
Pickup camper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Van/bus conversion	0.15	0.05	7.37	0.05	0.00	8.06	0.73	4.47	1.72
Other camp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tents	0.01	0.00	0.29	0.00	0.00	0.31	0.03	0.17	0.07
Other trailer	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
Other equip	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.01
Bikes	0.12	0.02	0.02	0.05	0.00	0.06	0.07	0.04	0.06
Other	0.69	0.10	0.13	0.25	0.01	0.35	0.39	0.24	0.35
CATEGORY TOTALS									
BOAT	47.74	0.32	22.52	49.61	0.04	31.91	28.22	28.78	28.37
FISH	9.31	1.12	3.78	4.00	1.29	3.32	5.41	2.88	4.74
HUNT	0.82	0.16	0.01	0.01	0.00	0.15	0.47	0.09	0.37
CAMP	1.94	0.58	94.17	0.65	0.04	103.03	9.37	57.13	21.96
OTHER	0.84	0.12	0.16	0.31	0.02	0.43	0.48	0.29	0.43
TOTAL	60.65	2.30	120.65	54.58	1.39	138.83	43.95	89.17	55.87

Table 198. Durable goods spending by segment and category (\$ per party-trip) within UMRS Region

CATEGORY	SEGMENTS						UMRS		Non- nts TOTAL
	R/D/B	R/D/NB	RES/OVN	NR/D/B	NR/D/NB	NR/OVN	Resident	Resic	
Motor boat	4.98	0.03	2.18	1.56	0.01	1.92	2.67	1.28	2.30
Non-Motorized boat	0.13	0.00	0.06	0.04	0.00	0.05	0.07	0.03	0.06
Other boats	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jet ski	0.78	0.01	0.34	0.24	0.00	0.28	0.42	0.20	0.36
Sailboard	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Boat engines	0.93	0.01	0.41	0.29	0.00	0.34	0.50	0.24	0.43
Boat trailer	0.49	0.00	0.22	0.15	0.00	0.18	0.26	0.13	0.23
Waterski	1.06	0.01	0.47	0.33	0.00	0.39	0.57	0.27	0.49
Boat accessories	1.06	0.01	0.46	0.33	0.00	0.39	0.57	0.27	0.49
Boat/engine/trailer c	26.01	0.17	11.40	8.14	0.03	9.51	13.94	6.68	12.00
Rods & reels	4.68	0.56	1.92	1.04	0.30	0.73	2.72	0.66	2.14
Nets, traps	0.49	0.06	0.20	0.11	0.03	0.08	0.28	0.07	0.22
Depth finders	1.08	0.13	0.45	0.24	0.07	0.17	0.63	0.15	0.50
Fishing clothing	0.30	0.04	0.12	0.07	0.02	0.05	0.18	0.04	0.14
Boots & waders	0.22	0.03	0.09	0.05	0.01	0.03	0.13	0.03	0.10
Trolling motors	1.23	0.15	0.51	0.27	0.08	0.19	0.72	0.17	0.56
Rifles	0.46	0.01	0.00	0.00	0.00	0.13	0.23	0.07	0.19
Decoys	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carriers and cases	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hunting boots	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber boots	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hunting clothing	0.06	0.00	0.00	0.00	0.00	0.02	0.03	0.01	0.03
Motor home	1.12	0.34	37.28	0.35	0.02	4.71	3.93	2.67	3.48
Travel trailer	0.38	0.12	12.72	0.12	0.01	1.61	1.34	0.91	1.19
Pop-up trailer	0.01	0.00	0.38	0.00	0.00	0.05	0.04	0.03	0.04
Pickup camper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Van/bus conversion	0.13	0.04	4.29	0.04	0.00	0.54	0.45	0.31	0.40
Other camp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tents	0.00	0.00	0.17	0.00	0.00	0.02	0.02	0.01	0.02
Other trailer	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
Other equip	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
Bikes	0.11	0.01	0.02	0.04	0.00	0.01	0.06	0.01	0.05
Other	0.60	0.07	0.10	0.20	0.01	0.08	0.33	0.08	0.26
CATEGORY TOTALS									
BOAT	35.44	0.23	15.53	11.09	0.04	12.96	19.00	9.10	16.36
FISH	8.01	0.96	3.29	1.78	0.51	1.24	4.65	1.13	3.67
HUNT	0.53	0.01	0.00	0.01	0.00	0.15	0.27	0.08	0.21
CAMP	1.64	0.50	54.84	0.52	0.03	6.93	5.78	3.93	5.11
OTHER	0.73	0.08	0.13	0.24	0.01	0.09	0.41	0.10	0.32
TOTAL	46.35	1.79	73.79	13.64	0.59	21.37	30.10	14.34	25.67

durable expenses by region using interview site locations, while the second uses county FIPS codes where durable purchases were made.

Estimates based on interview site locations were derived by applying the durable goods spending profiles for the six visitor segments (Table 15) to the distributions of visitors for each of the five regions (Table 6). This procedure assumes that spending profiles for particular segments do not vary by region and that the shares of visitors by segment for each region in the sample are representative of the population of visitors in each region. Results are given in Table 20 for both total durable goods spending and spending within the UMRS. The latter should be a reasonable approximation of durable goods spending within the smaller regions.

Reflecting the differences in segment shares across regions, visitors to the St. Paul region have the highest durable goods spending per party per trip. Regional differences in spending within the UMRS (bottom of table) are not significant, with the exception of sightseers who spend less on durable goods within the region than other user groups. Sightseers were more likely to have purchased camping vehicles than boating equipment or fishing gear, and camping vehicles tended to be bought near their home.

In the second approach, we directly estimated durable goods spending within each UMRS subregion based on where the durable items were purchased. The county of purchase for each item provided by the subjects in the on-site interview was used to identify where durable goods were bought. Of all durable goods expenses accruing to the UMRS region, 19% were in the St. Paul region, 29% in Rock Island, 33% in the St. Louis region and 19% in the Illinois River region. Comparing these results with Table 20 (the "Within the UMRS Region" estimates are the appropriate figures to compare with), we conclude that there is no strong evidence of significant differences among these four regions in patterns of durable goods spending. We therefore recommend applying the UMRS-wide estimates of durable goods spending per party-trip by segment (Table 15) to generate regional estimates, as we have done in Table 20.

Sampling Errors. Sampling errors for estimates of durable expenses are slightly larger than for trip spending in spite of somewhat larger sample sizes (the 1,316 on-site sample is used to estimate durable goods spending, compared with the sample of 683 mailback responses to estimate trip spending). The larger errors in durable goods spending are due to greater variance in the

Table 20. Durable goods spending estimates by region (\$ per party-trip)

	Durable Goods Spending Category					
REGION	BOAT	FISH	HUNT	CAMP	OTHER	TOTAL
----- SPENDING WITHIN OR OUTSIDE UMRS -----						
St. Paul	33.58	5.35	0.37	36.41	0.49	76.21
Rock Island	19.80	3.94	0.32	15.44	0.35	39.85
St. Louis	29.61	5.90	0.51	9.02	0.53	45.57
Illinois River	29.13	5.81	0.50	7.03	0.52	42.97
Sightseers	19.32	3.42	0.25	33.44	0.32	56.76
----- SPENDING WITHIN THE UMRS REGION -----						
St. Paul	19.47	4.02	0.24	8.12	0.35	32.20
Rock Island	12.75	3.17	0.16	5.66	0.27	22.02
St. Louis	20.99	4.94	0.30	3.06	0.44	29.73
Illinois River	20.46	4.84	0.30	2.50	0.43	28.53
Sightseers	11.05	2.39	0.14	5.06	0.20	18.84

Note: Regional estimates derived by applying regional segment shares (Table 6) to the durable goods spending profiles by segment (Table 15).

costs of durable items. As a percentage of the mean, standard errors for durable goods are about 13% for totals, local totals, and boating items (Table 21). Errors are larger for individual segments and other subcategories of durable goods. Only resident day user-boater segment and fishing items are near the 13% level of sampling error. Errors for other segments and categories of equipment exceed 25%. The estimates for camping equipment are particularly troublesome as large camping vehicles account for about 40% of durable goods expenses, but are subject to 32% sampling errors. The sampling scheme did not obtain a sufficient number of campers to accurately portray the amount spent on camping equipment. Campers are a small proportion of UMRS visitors, but spend large amounts on durable goods. Camping equipment is, however, often used at many sites and less directly associated with the UMRS than boating equipment. The estimates for boating are much more accurate.

#### LIMITATIONS

Three limitations deserve some discussion: (1) limitations due to sample sizes, (2) questions about representativeness of the sample with respect to segment shares, and (3) problems in attributing durable goods purchases to opportunities along the UMRS.

Sample Size. While the overall sample size of 1,316 on-site interviews and 683 mailback questionnaires are adequate to estimate the spending of an average visitor to the UMRS, there are constraints to generating accurate estimates for some subgroups of visitors. The original set of 18 segments were aggregated into six segments for which reasonably reliable spending profiles can be reported. In doing so, however, campers and other overnight visitor segments had to be combined. This limits the estimation of the impacts of actions that will primarily affect smaller subgroups of visitors, such as campers.

Unlike the previous study of 12 reservoirs, sampling plans were aimed at obtaining a representative sample of users, versus quotas of visitors within predefined categories (segments). Reflecting the population distributions, the sample therefore contains large numbers of day users and local visitors, and correspondingly small numbers of less frequent visitors. Estimates are therefore most reliable for the most frequently encountered user groups. Nonresident and overnight user segments are represented by



Table 21. Sampling errors for durable goods spending estimates

	Mean	Std. Err	95% Confidence Interval		Pct Error
TOTALS					
\$\$ Per Party-Trip	\$55.87	8.08	\$40	\$72	14%
\$\$ in Local Area	\$25.95	3.45	\$19	\$33	13%
BY MAJOR DURABLE ITEM CATEGORIES					
Boat	\$28.37	3.66	\$21	\$36	13%
Fish	\$4.74	0.81	\$3	\$6	17%
Hunt	\$0.37	0.22	(\$0)	\$1	60%
Camp	\$21.96	7.08	\$8	\$36	32%
Other	\$0.43	0.23	(\$0)	\$1	53%
BY SEGMENTS					
R/D/B	\$60.65	9.05	\$43	\$79	15%
R/D/NB	\$2.30	0.63	\$1	\$4	27%
R/OVN	\$120.65	47.87	\$25	\$216	40%
NR/D/B	\$54.58	22.28	\$10	\$99	41%
NR/D/NB	\$1.39	1.02	(\$1)	\$3	74%
NR/OVN	\$138.83	42.00	\$55	\$223	30%

- a. Pct Error = Standard error of the mean as a percentage of the mean  
Two standard errors yields a 95% confidence interval

considerably smaller samples. This limits the applications of the study for estimating impacts of actions that would largely affect these smaller sub-groups. Some of these groups may be small in numbers, but have significant impacts on particular areas or economic sectors. The data also contain small samples of off-season visitors, such as hunters and ice anglers.

Segment Shares. An advantage of the sampling scheme is that the sample segment shares provide estimates of the distribution of segments in the population of all UMRS visitors. However, the estimates of segment shares are subject to sampling errors and potential biases in the sampling plan. The sample was stratified by region, time, and a rough measure of use (high or low). Distinct visitor segments will be differentially attracted to sites based more on site characteristics than these stratification variables. For example, boaters will be found at sites with boat launch facilities or marinas, campers at sites near at least once indicates broad site coverage, but the representativeness of the sample of visitors (as contrasted with sites) will also depend on the degree to which sample sizes at particular types of sites and times are proportionate to total use.

Although the sample generated in this study will be used to estimate use of the UMRS, reliable estimates of use or segment shares cannot be made at a site or sub-regional level. Segment shares will be more prone to errors at the subregional level than at the aggregate level. Therefore, for applications to smaller geographic regions, independent estimates will be required. As some of the differences in segment shares across the four subregions (reported in Tables 5 and 6) are hard to explain, we urge that local and regional sources of information be used to validate or modify estimates of segment shares, whenever possible.

Durable Goods Spending Allocations. Durable goods spending impacts are reported as "associated with" the UMRS. We have intentionally avoided ad hoc procedures for assigning some portion of durable goods spending to the UMRS. In assessing the regional economic impacts of the UMRS in terms of durable goods purchases, the question is whether the item would have been purchased given a specific change in the quality or quantity of recreation opportunities on the UMRS. The answer to this question will vary across subjects, regions, types of equipment, and exactly what alternative is being evaluated. It is unrealistic to assume that visitors can determine their durable goods spending

behavior under the all-or-none alternative of eliminating recreation opportunities in the entire UMRS (Appendix A, Question 54). The durable goods spending effects of marginal changes in UMRS recreation opportunities will generally be small, but will depend on the availability of substitutes which will vary from region to region.

As the purpose of this study was to generate spending profiles that could be applied to a variety of decisions across a range of sites, no single question or set of questions could determine what share of durable purchases could be validly assigned to management decisions on the UMRS. Even a simple allocation of durable goods expenses based upon where the equipment was used would require that visitors be capable of estimating the proportions of use of each durable item at different sites. In light of the questions about reliability of such reports, as well as concerns about complicating the survey instrument, we did not attempt any such allocations.

Related considerations are involved in estimating trip spending impacts. What management actions will lead to the gain or loss of recreation trips and associated spending in an area? Only thirty percent of visitors indicated they would not have taken the recreation trip if "no sites were available for recreation along the UMRS." Thirty-seven percent (37%) would have taken a trip to the area and visited non-river sites, 18% would have taken a trip outside the UMRS, and 15% would visit both the UMRS and outside areas. Thus, about half of the trips (and probably a slightly higher proportion of all spending) would be lost to the region if UMRS recreation opportunities did not exist. Responses to hypothetical questions, however, provide at best a rough estimate of how people would actually respond to changes in the quality or quantity of recreation opportunities along the UMRS.

Further research on how the supply of recreation opportunities affects demand for recreation trips and durable goods is needed to better assess the impacts of recreation policy and management alternatives. This is one of several important linkages between demand and economic impact assessment.

## DISCUSSION

In addition to the findings discussed above, the contract for this study required an assessment of several issues. These issues are discussed in the order in which they appear in the proposal and SOW for this study.

1. What is the most precise unit of measure?

The contract for this study required the authors' recommendation as to the most precise unit of measure. The most common choices include: dollars per party per trip, dollars per person per trip, dollars per party per day, and dollars per person per day.

Precision refers to the relative ability to make fine distinctions between attributes of a variable (Babbie 1986). For example, describing someone as being "six feet three inches tall" is more precise than saying "around six feet." The desirability and necessity of precision depends on the purpose of the study. Precision and accuracy should not be confused. Saying that a person is "six feet three inches" is precise but inaccurate if, in fact, the person is "six feet ten inches" tall.

The decision to measure spending in dollars per party trip had less to do with precision and more to do with the measurement, sampling, and analytical considerations that affect the reliability and validity of our estimates. The UMRS sampling procedures use the party trip as the unit of analysis. Consistent with this sampling unit, trip spending was also measured on a party trip basis and durable goods spending was converted to this basis by dividing the costs of durable goods by the number of trips to the UMRS within the past year. The desire to estimate all expenses associated with trips to the UMRS argues for a trip-based estimate and the combination on-site, mail-back procedure that was employed in this study. This procedure measures all spending from when the party leaves home until they return home.

Estimating expenses on a per person basis can reduce variance associated with different party sizes for expenses on food and souvenirs that will more likely vary with party size. However, it adds variation for expenses like gasoline and durable goods that do not depend much on the size of the party. We do not recommend attempting to measure spending on a per person basis, as too many expenses associated with trips are shared by the traveling party. Another complication in per person estimates is how to account for children. For all of these reasons, we feel the party is preferred as the unit for measuring and reporting spending.

There are also some expenses that are better explained on a per day or per night basis. For example, lodging and food expenses will vary systematically with length of stay. However, other items like transportation costs and durable purchases depend less on length of stay than on trip distance and

activities. There are a number of problems in analyzing spending data that have been gathered on a per night basis (e.g., Peine and Renfro 1985). First, surveys that request spending only in the past 24 hours encounter telescoping problems and errors of omission, including those associated with credit card purchases or expenses paid before or at the end of the trip. Other errors can be caused by complications associated with a possible need to weight the sample based on length of stay or to adjust for "days vs. nights" (i.e. overnight visitors incur only 3 nights lodging for a 4 day stay). Again, for reasons related to a combination of measurement, sampling and analysis considerations, we find the trip preferred to the day or night as the temporal unit for reporting and analyzing spending data in most situations.

As spending applies best to the party-trip, we recommend converting units of use to party trips as needed, rather than vice versa. If use is measured in person days, this entails multiplying use by a party size estimate and a length of trip estimate. These conversions should be carried out for individual segments, when party size and length of stay data permit.

## 2. What is sufficient sample size for segments?

The minimum sample size required to estimate spending by segment depends on the amount of sampling error one can tolerate. Taking into account the likelihood of a variety of potential nonsampling errors (e.g., measurement errors, sensitivity of measures to outliers, nonresponse) and the expected accuracy of use estimates which will be multiplied by spending, we believe that sampling errors of below 20% are reasonable. Sampling errors for total trip and durable goods spending are 8% and 14%, respectively.

By segment, three of the six segments are below the 20% error threshold for trip spending and one out of six for durable goods spending. For trip spending (Table 12B), the three segments that equal or exceed the 20% error guideline contain sample sizes of less than 100 parties. Thus, for trip spending, a reasonable sampling goal in future studies is 100 to 120 parties per segment. For durable goods spending (Table 21), the only segment below the 20% error level (resident, day use boaters) has a sample size of 480 parties. The next lowest percent error (27%) is associated with a segment containing 405 parties. It appears that future studies interested in reporting durable goods spending by segment would need to consider a goal of 420 to 450 parties per segment or tolerate errors larger than 20%. Note, however,

that this contract called for durable goods spending to be reported primarily on an aggregate basis, not segment by segment. Thus, the 14% error associated with the full sample is well within the 20% guideline and implies that future studies where aggregate estimates of durable goods spending are required will need to consider a sampling goal of at least 1000 parties.

### 3. How much regional variation exists in spending and segments?

While some regional variations in spending can be observed in the sample (Tables 10 and 20), these differences generally are not statistically significant. Much of the difference can be attributable to differences in segment shares. The degree of representativeness in the regional samples of the segment distributions is uncertain. As only a small portion of sites could be sampled in each region, and these were not stratified by variables related to our segments, there is a good chance that variations in segment shares across regions are random or the result of sampling bias. While trip spending estimates are adjusted for nonresponse bias, the adjustment procedures assume the segment shares estimated in the on-site portion of the study are accurate. We urge that applications make use of independent estimates of segment shares for regions below the full UMRS level. Although there is no strong evidence for major differences in either trip or durable spending across broad subregions of the UMRS, there will be variations for smaller regions due to types of available sites and the levels of local economic development.

### 4. How well did the study capture the most significant segments and categories of spending?

The study design has captured the most significant segments and categories of spending. The low proportion of campers in the sample is more a reflection of the true nature of the study area (relatively few campgrounds) rather than some integral design flaw. The segments with the largest sample sizes are consistent with the use of the UMRS and the overall study design. For day users, residents of the UMRS outnumber nonresidents by more than five to one. Among overnight visitors, nonresidents were more than twice as numerous as residents.

Some segments have higher variances (and hence higher standard errors) than others and may require further disaggregation in future studies. For

example, the resident, day use boater segment has more than twice the sample size than the nonresident, overnight segment (n=259 vs n=110, respectively) but a somewhat larger percent error (13% vs 9%, respectively). For durable goods, reasonably reliable estimates for the most significant boating segments were obtained. The greatest weakness in durable goods spending estimates is for camping equipment. The sample is very thin for overnight visitors in general and in particular for campers. As large camping vehicles are very expensive, a small number of campers can contribute a large amount of total durable goods spending. More so than boating, however, camping equipment is usually not bought locally, and is likely used on trips to a variety of sites other than the UMRS.

5. What is the sum of trip and durable goods estimates by IMPLAN sector and region of expenditures?

One may combine overall trip spending (\$72 per trip) and durable goods spending (\$56 per trip) to obtain a total per trip spending of \$128 per party per trip. Similarly, one may combine the local portions of these expenses. However, for most analysis we urge that durable and trip spending be handled separately. The two classes of goods must generally be treated differently, as durable goods tend to be purchased near home and used at many sites, while most of the trip expenses occur at the destination and can be more directly associated with a particular site. The pattern of errors in durable and trip spending estimates are also different. When an estimate with considerable error is combined with a more precise estimate, precision is lost. Most applications would suggest a focus on either durable goods or trip spending separately, rather than combined.

#### APPLICATIONS OF RESULTS

There are many ways in which the results of this study may be applied. Before discussing those related to spending and economic impacts, we note that there are numerous analyses of the survey data set that could be carried out to support a variety of management and planning issues not related to economic impacts. For example, survey data include origin-destination information and descriptions of UMRS visitors and their trips to UMRS sites. These data can

be used in addressing many planning and marketing questions that go beyond the scope of this report.

The visitor spending analyses have been directed at estimating economic impacts of recreational use of the UMRS. These analyses have been further focused by the objective of developing final demand vectors that can be used with MICRO-IMPLAN software. In addition to a range of impact analyses that can be carried out using IMPLAN, the spending profile data can also be used by themselves. To derive estimates of total spending, the trip and durable spending profiles can be multiplied by estimates of party trips: (1) either in total or by segment, or (2) for the entire UMRS region, 5 subregions, or (with some adjustments) to individual states, communities or sites. These calculations can be readily carried out on spreadsheets to estimate shares of spending by sector or segment. Regional or local multipliers can be applied to these spending totals to derive rough estimates of indirect and induced effects. Impact estimates can also be converted to income and employment effects using appropriate sales to income and sales to employment ratios. These procedures would be appropriate for users who may not have ready access to IMPLAN or who may only want quick, aggregate estimates of impacts. Each of the IMPLAN applications discussed below has a corresponding application that relies on published multipliers or ratios rather than direct use of an input-output model.

#### **General IMPLAN Procedures**

As to applications that would directly involve IMPLAN or a similar input-output model, the general procedures are:

- (1) Select a suitable spending profile from the tables.
- (2) In some cases make adjustments to the profile.
- (3) Obtain an estimate of visits to the area. Convert the visitation estimate to party-trips by applying appropriate party size and length of stay estimates.
- (4) Estimate the proportion of party visits within the six defined segments. Multiply these proportions by the total visits to estimate the number of party visits by segment.
- (5) Multiply party visits for each segment by the appropriate segment spending profile and sum across segments to estimate total final demand.
- (6) Bridge final demand vector to the 528 IMPLAN sectors.



(7) Estimate an input-output model for the designated region using MICRO-IMPLAN and run the IMPLAN "Impact Analysis" on the resulting final demand vector. If interested in impacts by segment, runs can be made for individual segments.

Software has been developed in Lotus 1-2-3 version 2.0 to help estimate segment shares (steps 1-4) and to carry out steps 5 and 6 (Stynes and Propst 1992). It should be noted, that while the survey data yields estimates of segment shares for the UMRS region in total, local data will be needed to estimate segment shares for particular sites or counties and to validate segment shares at the regional level. A manual is under development to explain the entire process including a specialized interface with IMPLAN for these data (Stynes and Propst 1992). Specific economic impact applications using the results presented in this report are also contained in this manual.

#### SUGGESTIONS FOR FURTHER RESEARCH

The UMRS study provides a rich database for further analysis. Additional opportunities are presented by combining the UMRS data with data from other studies. The consistency in format for measuring spending within designated segments in the National Study, UMRS study, and other studies permits the combining of these data to (1) increase sample sizes (and thus accuracy of spending estimates) for segments and durable items that are not well represented, in the UMRS sample, e.g. overnight visitors and camping equipment; and (2) to test the generalizability of spending profiles over space and time. The latter is particularly important for applying the results of this study at a local level.

Somewhat different kinds of analysis are required to focus on local impacts, as contrasted with impacts for the entire UMRS region. At the local level, the primary concern should be trip spending, not durable goods. Resident segments must be defined based upon within 30 miles rather than within the UMRS and more attention should be given to origin-destination patterns of visitors. We recommend four interrelated areas for further study.

1. Developing models to predict variations in trip spending based upon visitor segment variables, site factors, and characteristics of the local economy.

We have begun the task of recording all locational designators in the UMRS survey data files to facilitate spatial modeling. We have also assembled

selected economic data for all counties within the UMRS region. Once these data are matched with site designators on the survey data files, we will be able to estimate trip spending models. Matching will entail a closer examination of local economic regions along the UMRS. In particular, locations of survey sites relative to population centers and bridges spanning these rivers must be evaluated. Bridge locations will dictate when local regions may extend to both sides of the river.

2. Developing guidelines for extending the local region beyond 30 miles. The proportion of trip spending that occurred outside 30 miles of the site but within the UMRS is not directly available in the survey data. Previous experience indicates that visitors can or will not be able to report spending within more than two regions. Simply defining the appropriate regions for subjects at many different sites is too complex. Instead of attempting to directly measure spending for local regions of differing sizes, we recommend developing adjustment factors that can be applied to our estimates to expand the region of interest. The task involves shifting some portion of the spending outside 30 miles to the "local spending" category. The portion will depend on how much larger a radius than 30 miles is chosen for the local region. Further analysis of origins of visitors is useful here, both to estimate segment shares for modified definitions of "local resident" and to estimate the adjustment factors to be applied to the spending profiles.

3. Identifying origin-destination patterns of UMRS visitors. Origin-destination analysis is needed to estimate demand for sites along the UMRS and to estimate the shares of visitors by resident and nonresident segments. Origin-destination studies would also help in identifying appropriate subregions within the UMRS and interregional flows of dollars between these regions.

4. Comparing I-O models for various counties and subregions in the UMRS. Applications of the spending profiles will involve estimation of input-output models for the UMRS and various subregions thereof. Comparisons of the regional economic structures of counties along the UMRS are recommended to provide further guidance for generalizing estimates of impacts from one area to another.

Further research on durable goods spending and its impacts are also recommended. Household surveys offer some advantages over on-site surveys for gathering data on durable goods. Durable goods purchases are often not trip or site specific. Spending on durable goods often cannot be attributed to a particular site. For impact analysis, the appropriate question is whether or not the item would have been purchased if the given site or sites were not available or were altered in quantity or quality. Camping vehicles in particular are purchased for a variety of purposes and are used at many sites, as well as at home. These purchases can seldom be attributed to the presence of a particular site or even set of sites. Boating equipment is more susceptible to impact analyses, although boats too can be used at many sites. Studies to correlate boat sales within designated regions with boating opportunities could provide more direct evidence of the impacts of supply on demand. Historical studies or trend analyses in areas where boating opportunities have changed over time may shed further light on this matter. More complete patterns of where boats of various size and type are used could also be helpful in attributing boat purchases to particular management decisions.

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APPENDIX A

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RECEIVED \_\_\_\_\_

Q.A. \_\_\_\_\_

D.E. \_\_\_\_\_

FILE \_\_\_\_\_

**UPPER MISSISSIPPI RIVER STUDY  
RECREATION EXPENDITURE SURVEY**

On-site Portion

OMB # 0702 - 0016

\_\_\_\_\_  
Site Name

Stratum: \_\_\_\_\_

AM / PM / ALL DAY

River: BL / CX / KA / IL / MS

WEEKDAY / WEEKEND

River mile: \_\_\_\_\_

FALL / WINTER / SPRING / SUMMER

Date:

--	--	--

MM DD YY

Code a new number for every form, beginning with 001 for each site and date. ID number:

--	--	--

\*\*\*\*\*

Hello. My name is \_\_\_\_\_ and I am working for PECO Enterprises under government contract. We are interviewing visitors to find out about their recreational use along 1200 miles of the Upper Mississippi River System and how their expenditures in this area affect the region's economy.

1. What was your primary purpose for visiting this recreation site today? Record below.

\_\_\_\_\_  
(vehicle 1)                      (vehicle 2)                      (vehicle 3)

If **NON-RECREATION**, say: That is all of the information that I need, thank you for stopping. End interview; record as a non-rec vehicle.

If **RECREATION**, continue.

1 2 3

--	--

total  
non-rec

2. Will you be returning to this site today?

If **YES**, say: That is all of the information that I need, thank you for stopping. End interview; record as a returning vehicle.

If **NO**, continue.

1 2 3

--	--

total  
returning

May I talk with you about your trip? Your answers are very important as they will help us understand current recreation use of the river system and make decisions about its future use. The questions that I have to ask will take about 10 minutes of your time. All of your answers will be kept in confidence and you will not be identified in the results. You may ask any questions at any time during the interview.

If **YES**, continue

If **NO**, tally as a refusal and thank person for their time

1 2 3

--	--

total  
refusals

If person agrees to the interview, record time \_\_\_\_\_ a.m. / p.m. and continue.  
Keep track of the number of exiting vehicles passed during the interview.

Hand the respondent the response card and say: This card will help you answer a number of the questions that I will ask. The map shows the area we are interested in for this study. This area consists of all land within 30 miles of five rivers: the Mississippi River north of Cairo, Illinois, and the Illinois, St. Croix, Black, and Kaskaskia Rivers. It includes parts of the states of Minnesota, Wisconsin, Iowa, Illinois, and Missouri.

3. Please tell me if your permanent home is located within the area marked on the map. Circle "Y" or "N" under "W/in Area" in the chart below.
4. What is the ZIPCode of your home? Record the ZIPCode in the column marked "Perm. Home" in the chart below. If the person does not know their ZIPCode, ask for the county (or city) and state where their permanent home is located. Record instead of ZIPCode in the "Perm. Home" column. Then, in the column marked "CO - CI", circle "CO" for a county name or "CI" for a city name.
5. How many of the people in this vehicle are from this ZIPCode? Record the number of people under "No." in the chart below.
6. Have you stayed at a vacation or second home since you left your permanent home? Circle "Y" or "N" in the column marked "Stayed at 2nd Home". If "NO", skip to Question 10.
7. By the time you return to your permanent home, will you have stayed at the vacation home for longer than 14 nights? Circle "Y" or "N" under "More than 14". If "NO", skip to Question 10.
8. What is the ZIPCode of the vacation home? Record response under "Second Home" and "CO - CI" according to instructions in Question 4.
9. From the time you left the vacation home until you return there, will you have visited a friend or relative's home, attended a business meeting, or visited any recreation sites outside the area marked on the map? Circle "Y" or "N" under "Other Activities". If everyone is from the same ZIPCode (Question 5), continue with the shaded box at the bottom of the page. Otherwise, skip to Question 11.
10. From the time you left your permanent home until you return there, will you have visited a friend or relative's home, attended a business meeting, or visited any recreation sites outside the area marked on the map? Circle "Y" or "N" under "Other Activities". If everyone is from the same ZIPCode (Question 5), continue with the shaded box at the bottom of the page. Otherwise, skip to Question 11.

3		4		5		6		7		8		9 / 10	
W/in Area		Perm. Home ZIPCode OR County or City & State	CO -- CI	No.	Stayed at 2nd Home	More Than 14	Second Home ZIPCode OR County or City & State	CO -- CI	Other Acti- vities				
1	Y N		CO CI		Y N	Y N		CO CI	Y N				

The trip origin is the respondent's permanent home unless the respondent answered "YES" to staying at his or her vacation home for longer than 14 nights. If the trip started from the:

- \* PERMANENT HOME, say: For the rest of this interview, when I say TRIP I am referring to your entire trip, from the time you left your permanent residence until the time you return there.
- \* VACATION HOME, say: For the rest of this interview, when I say TRIP I am referring to the time from when you left your vacation home until the time you return there or to your permanent home if you are not returning to your vacation home.

Skip to Question 20.



11. What other ZIPCodes do people in this vehicle come from? Record answers in the chart below according to the instructions in Question 4.

Ask Questions 12 - 18 of someone from each ZIPCode.

12. Please refer to the map and tell me if your permanent home is located within the area marked on the map. Circle "Y" or "N" under "W/in Area" in the chart below.
13. How many of the people in this vehicle are from this ZIPCode? Record the number of people in the chart below.
14. Have you stayed at a vacation or second home since you left your permanent home? Circle "Y" or "N" in the column marked "Stayed at 2nd Home". If "NO", skip to Question 18.
15. By the time you return to your permanent home, will you have stayed at the vacation home for longer than 14 nights? Circle "Y" or "N" under "More than 14". If "NO", skip to Question 18.
16. What is the ZIPCode of the vacation home? Record response under "Second Home" and "CO - CI" according to instructions in Question 4.
17. From the time you left the vacation home until you return there, will you have visited a friend or relative's home, attended a business meeting, or visited any recreation sites outside the area marked on the map? Circle "Y" or "N" under "Other Activities". Continue with Question 12 if there are other ZIPCodes, or Question 19 if finished.
18. From the time you left your permanent home until you return there, will you have visited a friend or relative's home, attended a business meeting, or visited any recreation sites outside the area marked on the map? Circle "Y" or "N" under "Other Activities". Continue with Question 12 if there are other ZIPCodes, or Question 19 if finished.

	12	11	13	14	15	16	17 / 18		
	W/in Area	<u>Perm. Home</u> ZIPCode OR County or City, & State	CO -- CI	No.	Stayed at 2nd Home	More Than 14	<u>Second Home</u> ZIPCode OR County or City, & State	CO -- CI	Other Acti- vities
2	Y N		CO CI		Y N	Y N		CO CI	Y N
3	Y N		CO CI		Y N	Y N		CO CI	Y N

19. Ask all visitors, including those from ZIPCode #1: Who has traveled the shortest distance to reach this recreation site? Ask that person: What ZIPCode did you come from? Circle the number associated with that ZIPCode.

1 / 2 / 3  
nearest ZIP

The trip origin is the permanent home of the visitor who traveled the shortest distance (Question 19) unless that person answered "YES" to staying at a vacation home for longer than 14 nights. In that case, the trip origin is his or her vacation home.

Refer to the person whose home was selected as the trip origin and if the trip started from a:

- \* PERMANENT HOME, say: For the rest of this interview, when I say TRIP I am referring to the time from when you left your permanent home until the time you return there.
- \* VACATION HOME, say: For the rest of this interview, when I say TRIP I am referring to the time from when you left the vacation home until the time you return there or to your permanent home if you are not returning to your vacation home.

20. Have you spent or do you plan to spend any nights away from your (permanent / vacation) home while on this trip? Circle "Y" or "N".

Y / N  
nights away

If YES, continue.

If NO, go to Question 35, page 6.

### OVERNIGHT VISITORS ONLY

21. How many nights have you spent away from home so far on this trip?  
If "0" skip to Question 24.

nights  
spent

22. How many of these nights have you spent within 30 miles of this site? If equal to the number nights away from home (Question 21), skip to Question 24.

spent  
w/in 30  
miles

23. Please refer to the map that I gave you. Excluding the \_\_\_ nights that you have spent within 30 miles of this site, how many nights have you spent within the area marked on the map?

spent  
within  
area

24. How many additional nights do you plan to spend away from home?  
If "0" skip to Question 27.

add'l  
nights

25. How many of these nights will be within 30 miles of this site? If equal to the number of additional nights away from home (Question 24), skip to Question 27.

add'l  
w/in 30  
miles

26. Please refer to the map again. Excluding the \_\_\_ nights that you plan to spend within 30 miles of this site, how many additional nights do you plan to spend within the area marked on the map?

add'l  
within  
area

27. Follow-up:



- a. Sum responses to Questions 21 and 24 -- total nights. Record total and ask: So, for the trip as we have defined it, you will have spent \_\_\_ nights away from home?
- b. Sum responses to Questions 22 and 25 -- nights within 30 miles of this site. Record total. If greater than "0" ask: Of these, a total of \_\_\_ nights will be spent within 30 miles of this site?
- c. Sum responses to Questions 23 and 26 -- nights spent within area marked on map beyond 30 miles of this site. Record total. If greater than "0" ask: A total of \_\_\_ nights will be spent within the area marked on the map and beyond 30 miles of this site?

The sum of "b" and "c" should not exceed "a". If it does, check responses to Questions 21 - 26 with the visitor.

total  
for  
trip

total  
w/in 30  
miles

total  
within  
area

28. If total nights within 30 miles of site (27b) is "0", skip to Question 29. Otherwise say: Please refer to the list of lodging categories on the other side of the card that I gave you. For the \_\_\_\_\_ nights that you said you have spent or will spend within 30 miles of this site, which types of lodging have you used or will you use?

Circle the "Y" next to all lodging types mentioned. If "OTHER", circle the "Y", then ask for and record the type of lodging.

\*\* If only one type of lodging was used, use total number of nights within 30 miles of the site (27b), to fill in nights.

\*\* If more than one lodging type was used, ask the following question for each type of lodging:

How many nights did you stay at or plan to stay at \_\_\_\_\_ (lodging type)?

29. If the total nights within the shaded area on the map and beyond 30 miles of this site (27c) is "0" skip to Question 30. Otherwise ask: For the \_\_\_\_\_ nights that you said you have spent or will spend within the area marked on the map and beyond 30 miles of this site, which types of lodging have you used or will you use?

Circle the "Y" next to all lodging types mentioned. If "OTHER", circle the "Y", then ask for and record the type of lodging.

\*\* If only one type of lodging was used, use total number of nights within the shaded area (27c), to fill in nights.

\*\* If more than one lodging type was used, ask the following question for each type of lodging:

How many nights did you stay at or plan to stay at \_\_\_\_\_ (lodging type)?

30. How many days have you spent at this site?

31. During your trip have you visited or will you be visiting any other recreation sites along the river banks in the area marked on the map (for recreation)? Circle "Y" or "N".

If "YES", continue.

If "NO", skip to Question 40.

32. Not including this site, how many of these other sites will you have visited on your trip?

33. How many days have you spent at these other recreation sites so far?

34. How many additional days do you intend to spend at these other sites? Skip to Question 41.

used	# nights	type
Y		hotel
Y		camp
Y		family / friends
Y		second home
Y		boat
Y		other

\_\_\_\_\_ type

used	# nights	type
Y		hotel
Y		camp
Y		family / friends
Y		second home
Y		boat
Y		other

\_\_\_\_\_ type

		days onsite
--	--	-------------

Y / N  
other sites

		# of sites
--	--	------------

		days spent
--	--	------------

		add'l days
--	--	------------

## DAY USERS ONLY

35. How many hours have you spent at this site today?

--	--

 hours onsite

36. During your trip today have you visited or will you be visiting any other recreation sites along the river banks in the area marked on the map (for recreation)? Circle "Y" or "N".

Y / N  
other sites

If "YES", continue.

If "NO", skip to Question 40.

37. Not including this site, how many of these other sites will you have visited on your trip?

--	--

 # of sites

38. How many hours have you spent so far at these other recreation sites?

--	--

 hours spent

39. How many additional hours do you intend to spend at these other sites today? Skip to Question 41.

--	--

 add'l hours

## ALL RESPONDENTS

40. Please refer to the list of activities on the card that I gave you and tell me how many of the people in this vehicle participated in each of these recreation activities while at this site. Record the number of people participating in each activity. When finished, skip to Question 42.

41. Please refer to the list of activities on the card that I gave you and tell me how many of the people in this vehicle participated or plan to participate in each of these recreation activities while on this trip. Include all recreation sites that you have visited or plan to visit and that are located along the banks of the rivers in the shaded area. Record the number of people participating in each activity.

### BOATING


*Total number using boat*

*Pleasure boating*

*Waterskiing*

*Fishing from boat*

### NON-BOATING


*Camping*

*Fishing from shore*

*Swimming*

*Picnicking*

*Hiking / walking / bicycling*

### FALL / WINTER ACTIVITIES


*Big game hunting* \*\*\*

*Small game hunting* \*

*Waterfowl hunting* \*\*\*

*Snowmobiling* \*

*Ice fishing* \*\*\*

*Cross-country skiing*

If boat was used to access site, record under boating as well.

OTHER - ex: sunbathing, socializing, etc.

--	--

Record type of activity: \_\_\_\_\_

### SIGHTSEEING

--	--

An individual should be recorded as sightseeing only if he or she is not participating in any other activity.

42. The card that I gave you has two lists of equipment on it. Please look at Equipment List Number 1 and tell me if anyone in your vehicle owns any of these items and has used it or will use it on this trip within the area marked on the map. Circle "Y" or "N". If there is no equipment, go to Question 44.

Y / N  
equip #1

43. For each piece of equipment that has been used or will be used, please give me the number listed beside it. I also need to know the following:

- approximate cost,
- whether the item was purchased new or used and if used, from a dealer or not,
- the county and state where the equipment was purchased, and
- the year the equipment was purchased.
- For boats, I need to know the type of boat, power type, and length in feet.

Record the responses in the chart below, placing each item on a separate line. When finished, continue with Question 44.

44. Please look at Equipment List Number 2. This time I am only interested in equipment that was purchased some time during the past 12 months. Please tell me if anyone in your vehicle owns any of these items and has used it or will use it on this trip within the area marked on the map? Circle "Y" or "N". If there is no equipment, go to Question 46.

Y / N  
equip #2

45. Please give me the letter listed beside each category of equipment that has been used or will be used. I also need to know the following for each category:

- the number of items used in the area marked on the map,
- the approximate cost for all items in that category,
- whether most of the items in the category were purchased new or used and if used, from a dealer or not, and
- the county and state where most of the items in the category were purchased.

Record the responses in the chart below, using a separate line for each equipment category. If equipment was purchased from a catalog, write the catalog name under "County". When finished, continue with Question 48.

Line #	Equip. number or letter	Number of items	Cost	New / Used-Dealer / Used-No Deal. (circle one)	County and ST OR City and ST	County or City	Year ---- #'s Only	BOATS ONLY		
								Boat Type	Power Type	Length (feet)
1				N / UD / UND		CO / CI				
2				N / UD / UND		CO / CI				
3				N / UD / UND		CO / CI				
4				N / UD / UND		CO / CI				
5				N / UD / UND		CO / CI				
6				N / UD / UND		CO / CI				
7				N / UD / UND		CO / CI				
8				N / UD / UND		CO / CI				
9				N / UD / UND		CO / CI				
10				N / UD / UND		CO / CI				

46. If the visitor did not report a boat, camping vehicle, or other motorized vehicle (Question 42), skip to Question 52. Otherwise ask: Did you have or will you have any storage costs for the (boat, camping vehicle, and/or motorized vehicle) you used on this trip, including dry storage and annual marina slip rental, for this calendar year? Circle "Y" or "N". If "NO", skip to Question 49.

Y / N  
storage

47. How much will you spend for storage within 30 miles of this site for your: (read from the chart all appropriate types of equipment) for this calendar year? Record totals for that type of equipment in the chart below.

48. How much will you spend for storage farther than 30 miles from this site for your: (read from the chart all appropriate types of equipment) for this calendar year? Record totals for that type of equipment in the chart below.

*Marina Slip Rental and Storage Costs:*

Equip. Type	Amount Spent Within 30 Miles of Site	Amount Spent Farther Than 30 Miles From Site
Boats		
RV's		
ORV's		

49. Did you have or will you have any insurance costs in this calendar year for the (boat, camping vehicle, and/or motorized vehicle) that you used on this trip. Circle "Y" or "N". If "NO", skip to Question 52.

Y / N  
insurance

50. How much will you spend in insurance with agents located within in 30 miles of this site for your: (read from the chart all appropriate types of equipment) for this calendar year? Record totals for that type of equipment in the chart below.

51. How much will you spend in insurance with agents located farther than 30 miles from this site for your: (read from the chart all appropriate types of equipment) for this calendar year? Record totals for that type of equipment in the chart below.

*Insurance Costs:*

Equip. Type	Amount Spent Within 30 Miles of Site	Amount Spent Farther Than 30 Miles From Site
Boats		
RV's		
ORV's		

52. If the visitor reported no expenditures (Questions 42 - 51) skip to Question 53. Otherwise ask: For most of the expenditures you reported do you feel that the information you just gave is: Circle "V", "R", "N" or "D".

V / R / N / D  
accuracy of responses

- a. Very accurate? (V)
- b. Reasonably accurate? (R)
- c. Not very accurate? (N)
- d. Or you don't know (D)

53. Not counting this trip, how many trips have you made since this time last year to recreation sites located in the area marked on the map? Count only those sites that are situated on the riverbanks.

--	--

 # of trips last yr

54. On this trip, if no sites were available for recreation along the river, which of the following would you have done: (Circle the letter corresponding to response.) DO NOT READ OPTION 'd' OR 'e'.

A / B / C / D / E

site not available

- a. Still made a trip, but visited non-river recreation sites in the shaded area?
- b. Still made a trip, but visited sites outside the shaded area?
- c. Not made a trip?

DO NOT READ:

- d. Both a + b.
- e. Don't know.

55. Including yourself, how many people are in your vehicle?

--	--

 # of people

56. How many of these people are 17 or younger? Record number.  
How many are 18 to 61? Record number.  
How many are 62 or older? Record number.


 up to 17  
18 - 61  
62 +

57. Which of the following groups best describes the people in this vehicle?

- a. Family
- b. Friends
- c. Relatives
- d. Other

Y alone  
Y family  
Y friends  
Y relatives  
Y other

Circle the "Y" for ALL appropriate categories. If the respondent specifies a category not listed, write his response in the space provided and circle the "Y" beside "other".

other category

Thank you for participating in this part of the study. We would also like your opinions on management of the river basin and some information on expenditures made while on this trip for items like food, lodging, and gasoline. I would like to give you a questionnaire to fill out when you finish your trip. On average, completing the form will take about 15 minutes. Your participation is important because you will be representing many visitors who do not have the opportunity to share their views.

- \* For a group with only one ZIPCode, ask the respondent: Will you be willing to complete the questionnaire?
- \* For a group that has more than one ZIPCode, say to the person whose home is the trip origin: Since I have been referring to your home as the trip origin, will you be willing to complete the questionnaire?

Y / N  
mailback

If YES, ask: (Transfer answers to the Address Sheet).

Trip: Perm. / Vac.

a. May I have the address of your permanent home? \_\_\_\_\_

City, State and ZIPCode: \_\_\_\_\_

b. May I also have your telephone number? \_\_\_\_\_/\_\_\_\_\_

c. What date do you expect to arrive home? \_\_\_\_\_

CLIP: Y / N

**FILL OUT A MAILBACK QUESTIONNAIRE WITH THE FOLLOWING INFORMATION:**

1. ID number (from page 1).
2. River and site names (from page 1).
3. Date of interview (from page 1).
4. Trip origin - circle either permanent home or seasonal home (from page 2 or 3).
5. Number of people in the vehicle (from page 9).

Show the mailback questionnaire to the respondent and explain briefly how it is to be completed. Point out that Column A of the expenditures (Within 30 miles) refers to the recreation site where the interview took place. Hand the questionnaire to the respondent.

Explain: When you record trip spending, please include not only your spending, but the spending of everyone in this vehicle. If, for instance, two people paid restaurant costs, enter the total amount in the space provided.

Whether the person agrees to complete the mailback or not, say: **THANK YOU FOR YOUR TIME.**

End the interview and record the following:

a. Ending time

\_\_\_\_\_ a.m. / p.m.

ending

b. Interviewer initials

\_\_\_\_\_ initials

c. Record the number of exiting vehicles passed during this interview

--	--

total  
passed

**On the first page, fill in the number of Non-rec and Returning vehicles and the number of Refusals.**



APPENDIX B

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## DEPARTMENT OF THE ARMY

ST PAUL DISTRICT CORPS OF ENGINEERS  
1128 U.S. POST OFFICE & CUSTOM HOUSE  
ST PAUL, MINNESOTA 55101-1278

STATION  
ATTENTION OF

Econ-Soc-Rec Branch  
Planning Division

November 1, 1989

### Please Return the Survey As Soon As You Complete Your Trip!

Dear Visitor:

Thank you for agreeing to participate in the expenditure portion of the Upper Mississippi River Basin recreation survey. Your answers are important because you will be representing many recreationists who do not have the opportunity to share their views. Because of this, the information you provide will help us plan not only for your future recreation needs, but for the needs of others like yourself.

Please record how much was spent on your trip by the people in your vehicle for the items listed on the survey form. More detailed instructions for completing the form are given on the first page of the form itself. The survey form should take about 15 minutes to complete, depending on how many expenditures you made. Your answers are voluntary and confidential! Your identity will remain anonymous--the answers you provide will be grouped with all others so that they cannot be associated with you or anyone else in your party.

When you have completed the survey form, please return it to Michigan State University (MSU) in the postage-paid envelope provided. Staff members at MSU will be conducting the data analysis for us. If you have any questions about completing the survey form or about the survey in general, feel free to contact Mr. Bruce Carlson, Chief, Economics and Social Analysis Section, at 612/220-0252.

Sincerely,

*Robert L. Baldwin*  
Robert L. Baldwin  
Colonel, Corps of Engineers  
District Engineer

The questions that follow are based on your recent recreation trip to the:

\_\_\_\_\_  
(River and Recreation Site Names)

where you were interviewed on \_\_\_\_\_  
(Date)

At that time there were \_\_\_\_\_ people in your vehicle and your trip origin for the purpose of this survey was established as your permanent home / vacation home.

There are two types of questions included in this questionnaire. The first deal with your opinions on the management of this site and the Upper Mississippi River Basin. The rest deal with recreation-related spending made in preparation for, during, and after your trip to the site noted above.

1. Why did you choose to visit the site where you were interviewed?
2. What improvements would you like to see made at that site?

3. This survey is concerned with the Upper Mississippi River Basin - an area made up of the land surrounding the Mississippi River north of Cairo, Illinois, and the commercially navigable parts of the Illinois, St. Croix, Minnesota, and Kaskaskia Rivers. The successful management of this river basin requires a balance of competing uses, such as recreation and commercial navigation, with environmental features. An important part of achieving this balance is the understanding of public needs and opinions.

What do you believe is the most important issue that affects the management of the Upper Mississippi River Basin?

# TRIP EXPENDITURES

Please record the trip-related spending made by all of the people that were in your vehicle at the time of the interview. There are two columns on the form. COLUMN A, is for spending within 30 miles of the site where you were interviewed. COLUMN B, is for spending everywhere else. The amounts you put in COLUMNS A and B should add up to the total spending for that spending category for your entire trip (based on the trip origin listed on the preceding page). For example, if the people in your vehicle spent \$60 at restaurants during the trip, of which \$20 was spent within 30 miles of the site, you would enter \$20 in COLUMN A and \$40 in COLUMN B.

Please record only spending related to the recreation activities on your trip. For example, if you stayed overnight on the drive to the river, write down the lodging cost. Report expenses for this trip only - do not report expenses for the whole year or for other trips.

Finally, it is important that you report how much was spent on the trip by everyone in the vehicle at the time of the interview, not just how much you spent. If you shared expenses with others, please find out how much they spent and add this to your expenditures before recording them on the form.

Please read through all items in each category of expenditures. If you have no expenditures to report for a given spending type, you do not need to write in 0's. Instead, place a check as instructed in the shaded box. For instance, if you had no lodging expenses, you would check the box as follows:

00

Put a check in the box [✓] if you had no lodging expenses.

## A. LODGING

- Hotels, motels, rental homes, rental boats, cabins, cottages, bed & breakfasts, resorts, rented condominiums, etc. \$ \_\_\_\_\_
- Campgrounds, rental RV sites \$ \_\_\_\_\_

If you stayed at a campground or rental RV site within 30 miles of the interview site, please give the campground or RV site name: \_\_\_\_\_

Put a check in the box [✓] if you had no lodging expenses.

COLUMN A  
within 30 miles  
of the site

COLUMN B  
farther than 30 miles  
from the site

## B. FOOD AND BEVERAGE

- Grocery, convenience, liquor, and other: food and beverage stores (for eating and drinking off-premises) \$ \_\_\_\_\_
- Restaurants, diners, taverns, bars, and other eating and drinking places \$ \_\_\_\_\_

Put a check in the box [✓] if you had no food or beverage expenses.

## C. AUTO AND RECREATION VEHICLE (RV) EXPENSES

- Auto or RV gas and oil \$ \_\_\_\_\_
- Auto or RV rental \$ \_\_\_\_\_
- Auto or RV repairs and washing \$ \_\_\_\_\_
- Auto or RV parts
  - tires \$ \_\_\_\_\_
  - all other parts \$ \_\_\_\_\_
- Parking fees and tolls (road, bridge, etc) \$ \_\_\_\_\_

Put a check in the box [✓] if you had no auto or recreation vehicle expenses.

## D. BOAT EXPENSES (THIS TRIP ONLY)

- Boat gas and oil \$ \_\_\_\_\_
- Boat or canoe rental \$ \_\_\_\_\_
- Boat repairs \$ \_\_\_\_\_
- Boat parts and accessories \$ \_\_\_\_\_
- Boat launch and transient slip fees \$ \_\_\_\_\_
- Boat fees on rivers, lakes or canals (not fishing charters, not ferry tolls) \$ \_\_\_\_\_

Put a check in the box [✓] if you had no boat expenses.

COLUMN A  
within 30 miles  
of the site

COLUMN B  
farther than 30 miles  
from the site

#### E. FISHING EXPENSES

- 1 Temporary fishing license just for the trip (not an annual license) ..... \$ \_\_\_\_\_
- 2 Fishing boat charter fee ..... \$ \_\_\_\_\_
- 3 Fishing bait ..... \$ \_\_\_\_\_

Put a check in the box [✓] if you had no fishing expenses.

☐

#### F. HUNTING EXPENSES

- 1 Temporary hunting license just for the trip (not an annual license) ..... \$ \_\_\_\_\_
- 2 Ammunition and handloading materials, not handloading machinery ..... \$ \_\_\_\_\_

Put a check in the box [✓] if you had no hunting expenses.

☐

#### G. OTHER ACTIVITY AND ENTERTAINMENT EXPENSES

- 1 Rental fees for recreation equipment - bicycles, golf carts, etc. (record boat, canoe rental in D.2) ..... \$ \_\_\_\_\_
- 2 Fees for guide services (tour guides, fishing and hunting guides, etc.) ..... \$ \_\_\_\_\_
- 3 Admission to spectator sports ..... \$ \_\_\_\_\_
- 4 Admission to tourist attractions (amusement parks, museums, etc.) ..... \$ \_\_\_\_\_
- 5 Other recreation (bowling, skating, video games, skiing, golfing, etc.) ..... \$ \_\_\_\_\_

Put a check in the box [✓] if you had no other activity or entertainment expenses.

☐

COLUMN A  
within 30 miles  
of the site

COLUMN B  
farther than 30 miles  
from the site

#### H. OTHER EXPENSES

1. Camera film, video tape purchase ..... \$ \_\_\_\_\_
2. Film developing, video tape processing .. \$ \_\_\_\_\_
3. Souvenirs and gifts (not clothes) ..... \$ \_\_\_\_\_
4. Clothing (not for hunting or fishing):
  - a. Footwear ..... \$ \_\_\_\_\_
  - b. Men's and boys' ..... \$ \_\_\_\_\_
  - c. Women's and girls' ..... \$ \_\_\_\_\_
5. Other: If you have other expenses not listed above, please record the type and amount of expending here. Examples include: airline fares, haircuts, laundry, doctor visit, etc.
  - a. type: ..... \$ \_\_\_\_\_
  - b. type: ..... \$ \_\_\_\_\_
  - c. type: ..... \$ \_\_\_\_\_

Put a check in the box [✓] if you had no other expenses.

☐

Place a check [✓] in the appropriate box below to indicate how accurate you believe your responses to the spending questions are.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%			

☐ The expenses I reported are accurate     
 ☐ The expenses I reported are fairly accurate     
 ☐ The expenses I reported are just guesses

Please fold this questionnaire so that the address is on the outside. Use the perforated tab to seal it, then drop it in the mail. No need to add postage.

THANK YOU FOR YOUR HELP!

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APPENDIX C

Table C-1. Distribution of visitor segments by five regions (UMRS study 1989-90): On-site and mailback surveys

1989-90: On-site and mailback surveys											
Segment	St. Paul		Rock Island		Region				Sightseers		Total N
	N	PCT	N	PCT	St. Louis N PCT	IL. River N PCT	N	PCT			
On-Site Survey											
R/D/B	118	38%	97	28%	128	55%	75	54%	49	18%	467
R/D/NB	42	14%	158	46%	68	29%	40	29%	88	33%	396
R/O/B	20	6%	10	3%	4	2%	3	2%	1	0%	38
R/O/NB	5	2%	3	1%	3	1%		0%	12	5%	23
R/C/B	6	2%	3	1%		0%		0%		0%	9
R/C/NB	1	0%	12	3%		0%		0%		0%	13
NR/D/B	32	10%	15	4%	4	2%	4	3%	3	1%	58
NR/D/NB	9	3%	22	6%	13	6%	11	8%	40	15%	95
NR/O/B	52	17%	9	3%	1	0%	2	1%	6	2%	70
NR/O/NB	15	5%	6	2%	7	3%	2	1%	63	24%	91
NR/C/B	3	1%		0%	2	1%	1	1%		0%	6
NR/C/NB	10	3%	8	2%	1	0%		0%	4	2%	23
Total	311	100%	343	100%	231	100%	138	100%	266	100%	1,289**
% of grand total	24%		26%		17%		10%		20%		100%
Mailback Survey											
R/D/B	65	40%	63	32%	71	61%	38	58%	18	14%	255
R/D/NB	10	6%	80	41%	32	28%	14	21%	43	33%	179
R/O/B	19	12%	9	5%	1	1%	3	5%		0%	32
R/O/NB	1	1%	3	2%	1	1%		0%	8	6%	13
R/C/B	3	2%	3	2%		0%		0%		0%	6
R/C/NB		0%	6	3%		0%		0%		0%	6
NR/D/B	14	9%	9	5%	2	2%	3	5%	2	2%	30
NR/D/NB	6	4%	9	5%	5	4%	2	3%	17	13%	39
NR/O/B	33	20%	7	4%		0%	2	3%	4	3%	46
NR/O/NB	5	3%	1	1%	4	3%	2	3%	38	29%	50
NR/C/B	2	1%		0%		0%	2	3%		0%	4
NR/C/NB	4	2%	5	3%		0%		0%	1	1%	10
Total	162	100%	195	100%	116	100%	66	100%	131	100%	670*
% of grand total	24%		29%		17%		9%		19%		100%

R/NR: Resident/Nonresident of UMRS

D/O/C: Day users/Other overnight visitor (noncamper)/Camper

B/NB: Boater/Nonboater

\* Mailback questionnaires had 13 missing segment identifiers (670+13=683)

\*\* On-site interviews had 27 missing segment identifiers (1,289+27=1316)



Table C-2. Total trip spending (\$ per party per trip) by 12 visitor segments, UMRS Study (1989-90):  
SEGMENT

Item	SEGMENT						UMRS Resident				UMRS NonResident				TOTAL	
	Day Users		Other Ovnite		Day Users		Campers		Other Ovnite		Campers		Other Ovnite		TOTAL	
	Boat	No Boat	Boat	No Boat	Boat	No Boat	Boat	No Boat	Boat	No Boat	Boat	No Boat	Boat	No Boat	Boat	No Boat
Hotel	0.00	0.00	0.00	0.00	31.52	50.38	0.00	0.00	0.00	0.00	0.00	2.00	35.68	54.33	7.56	1.48
Campgrounds	0.00	0.00	11.33	20.00	10.58	1.85	0.00	0.00	0.00	0.00	0.00	22.00	4.45	3.27	11.51	12.29
Grocery	8.74	4.53	30.00	27.83	36.36	14.23	10.13	6.67	32.75	27.70	35.17	23.39	15.50	40.28	43.67	12.23
Restaurant	5.53	5.31	0.00	10.83	43.24	34.38	6.33	10.79	19.75	15.50	40.28	27.57	53.10	26.28	5.10	0.73
Auto/RV gas & oil	8.62	5.10	17.50	15.17	37.18	18.54	16.17	8.15	46.75	53.10	26.28	0.00	0.00	0.00	0.04	0.48
Auto/RV rental	0.14	0.00	0.00	0.00	10.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03
Auto/RV repairs	0.59	0.03	26.67	1.67	1.30	0.00	0.00	0.00	0.08	1.25	0.00	0.00	0.00	0.00	0.00	0.30
Auto/RV tires	1.96	0.00	0.00	18.33	4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
Auto/RV parts	0.68	0.00	1.00	0.00	1.58	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.86
Auto/RV parking & tolls	0.15	0.08	2.83	0.17	1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
Boat gas & oil	9.34	0.00	12.17	0.00	25.30	0.00	9.43	0.00	23.75	0.00	19.81	0.00	0.00	0.00	0.00	1.00
Boat rental	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	1.49	0.00	0.00	0.00	0.00	0.06
Boat repairs	1.37	0.00	0.00	0.00	10.91	0.00	1.10	0.00	0.00	0.00	2.34	0.00	0.00	0.00	0.00	0.48
Boat parts	4.25	0.00	0.83	0.00	2.12	0.00	0.00	0.00	7.50	0.00	9.45	0.00	0.00	0.00	0.00	1.75
Boat launch fees	1.62	0.00	0.67	0.00	1.70	0.00	0.00	0.00	0.00	0.00	9.43	0.00	0.00	0.00	0.00	0.15
Boat fares	0.00	0.00	0.00	0.00	0.00	0.00	1.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55
Fishing license	1.02	0.08	0.00	0.00	0.42	0.00	0.00	0.00	2.50	0.00	1.09	0.00	0.00	0.00	0.00	0.30
Boat charter fee	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
Fishing bait	1.97	1.04	4.83	1.00	3.48	0.77	1.97	1.08	4.75	0.80	5.43	0.78	1.81	0.16	0.00	0.64
Hunting license	0.05	0.29	0.00	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.40
Ammunition	0.95	0.00	0.00	0.00	0.24	0.00	0.40	0.92	0.00	0.00	1.81	0.16	0.00	0.00	0.00	1.39
Equipment rental	0.14	0.24	0.00	0.00	0.76	0.00	0.00	0.13	0.00	0.00	1.53	0.88	0.00	0.00	0.00	0.84
Guide fees	0.00	0.00	0.00	0.00	1.52	3.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71
Spectator sports fee	0.00	0.09	0.00	0.00	2.36	0.15	0.00	0.05	0.00	0.00	0.00	0.04	0.00	0.00	0.00	1.92
Tourist attraction fee	0.04	0.15	0.00	0.00	3.03	2.92	0.00	0.05	0.00	0.00	0.38	5.96	0.00	0.00	0.00	0.84
Other recreation fee	0.12	0.03	0.00	1.33	2.79	0.00	0.00	1.85	0.00	0.00	2.06	0.00	3.40	2.22	1.39	0.71
Film purchase	1.32	0.79	1.33	1.83	6.15	2.31	0.50	0.41	2.50	3.40	2.45	2.22	2.70	1.83	0.71	1.92
Film developing	0.84	0.36	0.00	5.00	4.70	0.23	0.30	0.18	1.50	2.70	1.83	0.71	3.70	2.87	12.55	1.07
Souvenirs	0.29	0.82	0.00	11.67	4.36	11.15	0.00	0.00	7.50	3.70	2.87	12.55	0.00	0.00	0.00	1.11
Footwear	1.78	0.25	0.00	11.67	2.88	0.00	0.00	0.00	0.00	0.00	2.62	0.00	0.00	0.00	0.00	1.92
Men's clothing	1.33	0.00	0.00	0.00	4.85	0.38	0.00	0.90	0.00	0.00	6.45	0.76	1.00	5.64	1.88	1.58
Women's clothing	1.90	0.98	0.00	19.83	3.70	3.23	0.00	1.54	0.00	1.00	5.64	1.88	1.50	6.78	72.47	68%
All Other	0.37	1.96	0.00	3.33	4.88	1.54	0.73	0.00	0.00	1.50	1.96	6.78	190.86	47%	91	50
Total	55.13	22.15	109.17	149.67	266.00	146.08	48.30	32.79	152.50	133.40	221.04	190.86	75%	47%	72.47	68%
% within 30 miles	89%	75%	97%	43%	54%	42%	66%	51%	53%	68%	75%	47%	75%	47%	91	50
N/On-Site	480	405	9	13	39	23	60	95	6	23	72	91	10	47	50	683
N/Mailbac	260	185	6	6	33	13	30	39	4	10	47	50	4	47	50	683

	N	Mean	Std. Dev.	Minimum	Maximum
1. Total trip spending includes spending both within and outside 30 miles of the site	200	18.5	9	0	33

Note: Total trip spending includes spending both within and outside 30 miles of the site

Table C-3. Trip spending within 30 miles of the site (\$ per party per trip) by 12 visitor segments, UMRS study (1989-90).

ITEM	SEGMENT												TOTAL
	Day Users				UMRS Resident				UMRS Nonresident				
	Boat	No Boat	Boat	No Boat	Boat	No Boat	Boat	No Boat	Boat	No Boat	Boat	No Boat	
Hotel	0.00	0.00	0.00	0.00	0.00	0.00	18.64	20.00	0.00	0.00	2.00	26.96	4.40
Campgrounds	0.00	0.00	11.33	11.67	8.03	1.85	0.00	0.00	0.00	0.00	19.30	1.73	1.15
Grocery	7.46	3.70	30.00	17.00	21.82	7.77	5.03	25.25	7.13	5.03	21.20	8.84	8.18
Restaurant	4.69	4.03	0.00	8.33	24.76	17.69	4.50	4.90	4.50	4.90	13.25	22.92	8.37
Auto/RV gas & oil	6.69	3.75	15.83	9.67	19.36	8.31	8.90	2.69	8.90	2.69	20.00	10.14	7.11
Auto/RV rental	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.06	0.25
Auto/RV repairs	0.59	0.03	26.67	0.83	0.36	0.00	0.00	0.08	0.00	0.00	0.00	0.04	0.44
Auto/RV tires	1.96	0.00	0.00	9.17	1.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85
Auto/RV parts	0.68	0.00	1.00	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28
Auto/RV parking & tolls	0.14	0.08	2.50	0.17	0.06	0.08	0.00	0.00	0.00	0.00	0.00	0.31	0.12
Boat gas & oil	8.50	0.00	10.83	0.00	15.00	0.00	7.97	0.00	7.97	0.00	10.00	0.00	4.90
Boat rental	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Boat repairs	1.37	0.00	0.00	0.00	9.70	0.00	1.10	0.00	1.10	0.00	0.00	0.00	0.91
Boat parts	4.06	0.00	0.83	0.00	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.81
Boat launch fees	1.56	0.00	0.67	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89
Boat fares	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fishing license	0.82	0.08	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.41
Boat charter fee	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fishing bait	1.78	0.99	4.83	0.50	3.24	0.77	1.63	0.79	1.63	0.79	1.00	0.00	0.01
Hunting license	0.05	0.29	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.40	0.51	1.57
Ammunition	0.72	0.00	0.00	0.00	0.24	0.00	0.40	0.00	0.40	0.00	0.00	0.00	0.13
Equipment rental	0.14	0.24	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.32
Guide fees	0.00	0.00	0.00	0.00	1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Spectator sports fee	0.00	0.00	0.00	0.00	1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Tourist attraction fee	0.04	0.10	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.05	0.00	1.00	0.12
Other recreation fee	0.12	0.03	0.00	0.67	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
Film purchase	1.19	0.40	1.33	0.83	1.03	1.92	0.23	0.41	0.23	0.41	1.25	0.71	0.86
Film developing	0.60	0.24	0.00	1.67	0.79	0.23	0.00	0.18	0.00	0.00	0.00	0.18	0.40
Souvenirs	0.21	0.82	0.00	0.00	1.39	0.77	0.00	0.00	0.00	0.00	7.50	8.43	1.17
Footwear	1.78	0.19	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.86
Men's clothing	1.33	0.00	0.00	0.00	3.70	0.00	0.00	0.90	0.00	0.00	0.00	0.76	1.07
Women's clothing	1.83	0.71	0.00	3.17	2.12	0.00	0.00	1.54	0.00	1.54	1.00	1.57	1.53
All Other	0.37	0.91	0.00	0.00	3.52	1.54	0.00	0.00	0.00	0.00	1.50	1.51	0.78
Total	48.80	16.59	105.83	63.67	143.82	60.92	31.87	16.56	80.75	91.20	165.89	89.29	49.45

Table C-4. Percentage of UMRS Visitors With Durable Equipment by Segment

12 SEGMENTS	N	LIST 1 PCT	LIST 2 PCT	EITHER PCT
R/D/B	480	94%	44%	95%
R/D/NB	405	6%	17%	20%
R/O/B	35	97%	49%	97%
R/O/NB	27	4%	19%	19%
R/C/B	6	100%	17%	100%
R/C/NB	16	94%	6%	94%
NR/D/B	60	93%	34%	92%
NR/D/N/B	95	6%	15%	18%
NR/O/B	67	95%	29%	97%
NR/O/N/B	96	13%	14%	22%
NR/C/B	6	100%	50%	100%
NR/C/N/B	23	78%	17%	87%
TOTAL	1,316	53%	29%	59%

- a. List 1 includes all major durable goods brought on the trip for use on UMRS.
- b. List 2 includes smaller durable goods purchased within the past year.

Table C-5. Durable spending per party per trip by segment and major category of durables

TWELVE SEGMENTS	N	Total	In UMRS Region	Pct Local	TOTAL SPENDING					SPENDING IN UMRS REGION				
					BOAT	CAMP	FISH	HUNT	OTHER	BOAT	CAMP	FISH	HUNT	OTHER
					-----Dollars per party trip-----									
R/D/B	480	\$60.65	\$46.35	76%	47.74	1.94	9.31	0.82	0.84	35.44	1.64	8.01	0.53	0.73
R/D/NB	405	\$2.30	\$1.79	78%	0.32	0.58	1.12	0.16	0.12	0.23	0.50	0.96	0.01	0.08
R/O/B	35	\$38.57	\$27.86	72%	28.33	1.18	8.65	0.03	0.38	19.09	1.00	7.48	0.01	0.29
R/O/NB	27	\$0.63	\$0.63	100%	0.04	0.03	0.55	0.00	0.01	0.04	0.03	0.55	0.00	0.01
R/C/B	6	\$149.82	\$105.90	71%	149.82	0.00	0.00	0.00	0.00	105.90	0.00	0.00	0.00	0.00
R/C/NB	16	\$491.76	\$285.66	58%	0.00	491.76	0.00	0.00	0.00	0.00	285.66	0.00	0.00	0.00
NR/D/B	60	\$54.58	\$13.64	25%	49.61	0.65	4.00	0.01	0.31	11.09	0.52	1.78	0.01	0.24
NR/D/NB	95	\$1.39	\$0.59	42%	0.04	0.04	1.29	0.00	0.02	0.04	0.03	0.51	0.00	0.01
NR/O/B	67	\$68.63	\$38.83	57%	64.40	1.31	2.79	0.00	0.12	36.46	1.03	1.27	0.00	0.08
NR/O/NB	96	\$63.57	\$1.32	2%	1.28	78.58	2.95	0.29	0.46	0.06	0.05	0.90	0.29	0.02
NR/C/B	6	\$311.28	\$11.11	4%	279.73	11.66	15.42	0.10	4.37	5.75	3.22	0.60	0.04	1.51
NR/C/NB	23	\$529.02	\$56.85	11%	0.44	525.20	3.21	0.00	0.16	0.20	53.82	2.76	0.00	0.07
TOTAL	1316	\$55.87	\$25.95	46%	28.37	21.96	4.74	0.37	0.43	16.39	5.29	3.73	0.22	0.32

Table C-6. Durable spending by segment and category (\$ per party-trip) - ALL SPENDING

TWELVE SEGMENTS														
SEGMENTS		UMRS						Non-						
CATEGORY	CAT #	R/D/B	R/D/NB	R/O/B	R/O/NB	R/C/B	R/C/NB	NR/D/B	NR/D/NB	NR/O/B	NR/O/NB	NR/C/B	NR/C/NB	TOTAL
Motor boat	10	6.70	0.05	3.98	0.01	21.04	0.00	6.97	0.01	9.04	0.18	39.28	0.06	3.98
NonMotorized boat	11	0.17	0.00	0.10	0.00	0.55	0.00	0.18	0.00	0.24	0.00	1.02	0.00	0.10
Other boats	12	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.03	0.00	0.00
Jet ski	13	1.05	0.01	0.62	0.00	3.28	0.00	1.09	0.00	1.41	0.03	6.12	0.01	0.62
Sailboard	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Boat engines	15	1.25	0.01	0.74	0.00	3.93	0.00	1.30	0.00	1.69	0.03	7.34	0.01	0.74
Boat trailer	16	0.66	0.00	0.39	0.00	2.08	0.00	0.69	0.00	0.90	0.02	3.89	0.01	0.39
Waterski	17	1.43	0.01	0.85	0.00	4.50	0.00	1.49	0.00	1.93	0.04	8.40	0.01	0.85
Boat accessories	18	1.43	0.01	0.85	0.00	4.48	0.00	1.48	0.00	1.92	0.04	8.36	0.01	0.85
Boat/engine/trailer c	19	35.04	0.24	20.79	0.03	109.95	0.00	36.41	0.03	47.26	0.94	205.28	0.33	20.82
Rods & reels	20	5.44	0.66	5.06	0.32	0.00	0.00	2.34	0.76	1.63	1.72	9.01	1.88	2.77
Nets, traps	21	0.57	0.07	0.53	0.03	0.00	0.00	0.24	0.08	0.17	0.18	0.94	0.20	0.29
Depth finders	22	1.26	0.15	1.17	0.07	0.00	0.00	0.54	0.18	0.38	0.40	2.09	0.43	0.64
Fishing clothing	23	0.35	0.04	0.33	0.02	0.00	0.00	0.15	0.05	0.11	0.11	0.58	0.12	0.18
Boots & waders	24	0.26	0.03	0.24	0.02	0.00	0.00	0.11	0.04	0.08	0.08	0.43	0.09	0.13
Trolling motors	25	1.43	0.17	1.33	0.08	0.00	0.00	0.62	0.20	0.43	0.45	2.37	0.49	0.73
Rifles	30	0.71	0.14	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.26	0.09	0.00	0.32
Decoys	32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carriers and cases	33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hunting boots	34	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber boots	35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hunting clothing	36	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.04
Motor home	40	1.32	0.39	0.80	0.02	0.00	334.29	0.44	0.02	0.89	53.42	7.93	357.02	14.93
Travel trailer	41	0.45	0.13	0.27	0.01	0.00	114.11	0.15	0.01	0.30	18.23	2.71	121.87	5.10
Pop-up trailer	42	0.01	0.00	0.01	0.00	0.00	3.40	0.00	0.00	0.01	0.54	0.08	3.64	0.15
Pickup camper	43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Van/bus conversion	44	0.15	0.05	0.09	0.00	0.00	38.46	0.05	0.00	0.10	6.15	0.91	41.08	1.72
Other camp	45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tents	46	0.01	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.24	0.04	1.60	0.07
Other trailer	60	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.00	0.01
Other equip	61	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.08	0.00	0.01
Bikes	62	0.12	0.02	0.06	0.00	0.00	0.00	0.05	0.00	0.02	0.07	0.65	0.02	0.06
Other	63	0.69	0.10	0.31	0.01	0.00	0.00	0.25	0.01	0.10	0.38	3.58	0.13	0.35
CATEGORY TOTALS														
BOAT		47.74	0.32	28.33	0.04	149.82	0.00	49.61	0.04	66.40	1.28	279.73	0.44	28.37
FISH		9.31	1.12	8.65	0.55	0.00	0.00	4.00	1.29	2.79	2.95	15.42	3.21	4.74
HUNT		0.82	0.16	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.29	0.10	0.00	0.37
CAMP		1.94	0.58	1.18	0.03	0.00	491.76	0.65	0.04	1.31	78.58	11.66	525.20	21.96
OTHER		0.84	0.12	0.38	0.01	0.00	0.00	0.31	0.02	0.12	0.46	4.37	0.16	0.43
TOTAL		60.65	2.30	38.57	0.63	149.82	491.76	54.58	1.39	68.63	83.57	311.28	529.02	55.87

Table C-7. Durable spending by segment and category (\$ per party-trip) - WITHIN THE UMRS

CATEGORY	TWELVE SEGMENTS											
	R/D/B	R/D/NB	R/O/B	R/O/NB	R/C/B	R/C/NB	NR/D/B	NR/D/NB	NR/O/B	NR/O/NB	NR/C/B	NR/C/NB
Motor boat	4.98	0.03	2.68	0.01	14.87	0.00	1.56	0.01	5.12	0.01	0.81	0.03
Nonmotorized boat	0.13	0.00	0.07	0.00	0.39	0.00	0.04	0.00	0.13	0.00	0.02	0.00
Other boats	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jet ski	0.78	0.01	0.42	0.00	2.32	0.00	0.24	0.00	0.80	0.00	0.13	0.00
Sailboard	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Boat engines	0.93	0.01	0.50	0.00	2.78	0.00	0.29	0.00	0.96	0.00	0.15	0.01
Boat trailer	0.49	0.00	0.27	0.00	1.47	0.00	0.15	0.00	0.51	0.00	0.08	0.00
Waterski	1.06	0.01	0.57	0.00	3.18	0.00	0.33	0.00	1.09	0.00	0.17	0.01
Boat accessories	1.06	0.01	0.57	0.00	3.16	0.00	0.33	0.00	1.09	0.00	0.17	0.01
Boat/engine/ trailer c	26.01	0.17	14.01	0.03	77.72	0.00	8.14	0.03	26.76	0.05	4.22	0.15
Rods & reels	4.68	0.56	4.37	0.32	0.00	0.00	1.04	0.30	0.74	0.53	0.35	1.61
Nets, traps	0.49	0.06	0.45	0.03	0.00	0.00	0.11	0.03	0.08	0.05	0.04	0.17
Depth finders	1.08	0.13	1.01	0.07	0.00	0.00	0.24	0.07	0.17	0.12	0.08	0.37
Fishing clothing	0.30	0.04	0.28	0.02	0.00	0.00	0.07	0.02	0.05	0.03	0.02	0.10
Boots & waders	0.22	0.03	0.21	0.02	0.00	0.00	0.05	0.01	0.04	0.03	0.02	0.08
Trotting motors	1.23	0.15	1.15	0.08	0.00	0.00	0.27	0.08	0.19	0.14	0.09	0.42
Rifles	0.46	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.03	0.00
Decoys	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carriers and cases	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hunting boots	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rubber boots	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hunting clothing	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
Motor home	1.12	0.34	0.68	0.02	0.00	194.18	0.35	0.02	0.70	0.03	2.19	36.58
Travel trailer	0.38	0.12	0.23	0.01	0.00	66.28	0.12	0.01	0.24	0.01	0.75	12.49
Pop-up trailer	0.01	0.00	0.01	0.00	0.00	1.98	0.00	0.00	0.01	0.00	0.02	0.37
Pickup camper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Van/bus conversion	0.13	0.04	0.08	0.00	0.00	22.34	0.04	0.00	0.08	0.00	0.25	4.21
Other camp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tents	0.00	0.00	0.00	0.00	0.00	0.87	0.00	0.00	0.00	0.00	0.01	0.16
Other trailer	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
Other equip	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
Bikes	0.11	0.01	0.04	0.00	0.00	0.00	0.04	0.00	0.01	0.00	0.22	0.01
Other	0.60	0.07	0.24	0.01	0.00	0.00	0.20	0.01	0.06	0.02	1.23	0.06

## CATEGORY TOTALS

BOAT	35.44	0.23	19.09	0.04	105.90	0.00	11.09	0.04	36.46	0.06	5.75	0.20
FISH	8.01	0.96	7.48	0.55	0.00	0.00	1.78	0.51	1.27	0.90	0.60	2.76
HUNT	0.53	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.29	0.04	0.00
CAMP	1.64	0.50	1.00	0.03	0.00	285.66	0.52	0.03	1.03	0.05	3.22	53.82
OTHER	0.73	0.08	0.29	0.01	0.00	0.00	0.24	0.01	0.08	0.02	1.51	0.07
TOTAL	46.35	1.79	27.86	0.63	105.90	285.66	13.64	0.59	38.83	1.32	11.11	56.85
N OF CASES	480	405	35	27	6	16	60	95	67	96	6	23
												1,316

APPENDIX D

## DATA CLEANING AND EDITING TASKS

A number of data cleaning and editing tasks were performed. The most important ones are briefly described below.

1. Length of Variable Names. On-site interview data were received from the other contractor as Dbase IV files. Twenty-six variable names in the Dbase files exceeded the character length limitation of SPSS-PC and had to be renamed.
2. Missings. Whenever means were computed using SPSS-PC, all user-defined missings (e.g., 9's) were excluded from analysis.
3. Identification Numbers. For a given date, interviewers numbered the on-site interview forms sequentially beginning with "001." Thus, the identification number consisted of the date plus the ID number. The interview date was coded by the other contractor as an alphanumeric variable. In order to sort the data and perform other analyses, the date variable had to be recoded into three numeric variables consisting of month, day, and year of the interview.
4. Alphanumeric to Numeric. A number of variables had to be recoded from their character codes into a numeric form. These variables included county and city names of place of residence, types of overnight lodging accommodations other than the ones listed in the interview, recreation activities other than the ones listed, county and city names where durable goods were purchased, and types of groups other than family, friends, and so on.
5. Out-of-Range Codes. A number of variables as received from the other contractor contained out-of-range codes and had to be corrected. For example, both the beginning time and ending time variables contained codes which exceeded the military time maximum of 2400 hours.
6. Joining On-site and Mailback Databases. When these two databases were merged using the "JOIN MATCH" procedure in SPSS-PC, two major problems arose. The first was the presence of mailback surveys with no corresponding on-site interviews. In most cases, the problem was the incorrect coding of date, identification number, or site number on the on-site interview. The second problem related to logical inconsistencies in segment specification. A number of parties identified as day users reported spending money on lodging. A number of groups defined as nonboaters reported boat-related expenses. Apparently, there was either confusion during the on-site interview or a change in trip plans after the interview. For instance, those who said they were spending no nights away from home on this trip (i.e., day users) may have later changed their minds and used overnight accommodations. Those who said they did not engage in boating may have thought the question pertaining only to the site where they were interviewed. They may have incurred boating expenses later on the same trip at a different site and included these expenses on the mailback questionnaire. Those "day users" who reported lodging expenses were recoded into "overnight users." Likewise, "nonboaters" who reported boating expenses were recoded into "boaters."
7. Outliers. For trip spending, each instance of more than \$500 in spending for any item on the mailback questionnaire was identified. The effect of these outliers was assessed by examining the proportional change in mean



spending for a given item with and without the outliers. For those goods and services purchased by few parties and where the effect of outliers on average spending was noticeable (i.e. varied by more than a few percentage points), the outliers were excluded from analysis. This process resulted in the exclusion of two outliers, both of which were auto/RV repair costs exceeding \$1000 per trip.

There were 31 durable items with no cost figure reported and 37 items with a cost of greater than one hundred thousand dollars. The latter were primarily boat/trailer combinations and motorhomes. When converted to a per trip basis 7 durable items exceeded \$30,000 per trip. These items were deleted from the durable goods analysis as outliers. Their exclusion reduces large variances for subcategories, segments and regions based upon which large cost items happen to be included, while not significantly altering the overall population mean. Exclusion of these outliers yields results that are less sensitive to the particular sample chosen, and makes the resulting estimates more conservative.

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PART TWO  
DOCK OWNERS AND MARINA USERS:  
RECREATION SPENDING ON THE UPPER  
MISSISSIPPI RIVER SYSTEM

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## BACKGROUND

This portion of the report provides both trip and durable goods spending profiles for dock owners and marina users utilizing the Upper Mississippi River System (UMRS). These spending profiles were derived from the household telephone and mailback questionnaire phase of the total UMRS study and are based on households that rent marina slips or have licensed boat docks.

The remainder of this part is divided into the following major sections: PROCEDURES, RESULTS, and DISCUSSION. The PROCEDURES section outlines the general data collection and analysis methods for both dock owners and marina slip renters. The RESULTS section divides the findings into two subcategories, "trip expenditures" and "durable goods spending." Trip and durable goods expenditure profiles are presented for dock owners and marina slip renters, respectively. In the DISCUSSION section, the findings are interpreted in relation to the results of the developed areas study and the limitations inherent in this study. The DISCUSSION section also describes applications of the dock owner and marina user results. Specifically, economic impact applications through the use of IMPLAN and non-IMPLAN procedures are recommended.

## PROCEDURES

To achieve stated objectives, the methods employed in this phase of the total UMRS study also take into account the most common uses of recreational spending data, including the specific requirements of IMPLAN-PC. For purposes of definition and measurement, recreational spending is divided into two distinct categories: durable goods spending (e.g., boats, RV's, bicycles) and variable trip costs (e.g., hotels, meals). Two separate contractors (one for dock owners and one for marina users) conducted the household telephone interview, a modification of the on-site interview developed for the UMRS developed areas study. The telephone interview obtained recreation use and durable goods spending data. Variable trip costs were measured through the use of a mailback questionnaire distributed by the telephone interview contractors. By separating durable goods spending from variable trip expenditures, the two-step, telephone interview and mailback questionnaire procedure minimizes

confusion on the part of the respondent. This dual approach also minimizes respondent burden by reducing the length of the telephone interview.

The principal investigator (PI) of this phase of the study received the results of the telephone interviews from the two contractors and the mailback questionnaires directly from the households. The PI analyzed these data in such a manner so as to produce the spending profiles.

### Sample Selection

Detailed procedures for the random selection of sampling frames for both the marina users and dock owners are provided in the sampling plan for the full UMRS study (U.S. Army Engineer Corps of Engineers, 1989). The names and addresses of marina users were obtained from marina owners while similar information regarding dock owners was provided by the Corps of Engineers for all licensed boat docks along the UMRS. From the two lists, panels of 150 households for each of the two groups (marina users and dock owners) were randomly drawn. Each household was contacted to ascertain willingness to participate in the study. Those households who were unwilling to participate were replaced by those who were until the goal of 150 households per panel was achieved.

### Methods

Profile telephone interviews (Appendix A) were conducted for each household to obtain background information as well as durable goods spending data. Thereafter, follow-up telephone calls (Appendix B) were made to households on randomly selected dates throughout the year. Follow-up calls were placed to the marina panel three times in each of three seasons (spring, summer, and fall) for a total of nine attempted follow-up contacts. One additional follow-up call was placed to the dock owner panel during the winter season for a total of ten follow-up calls for this group. During the follow-up calls, the slip renter or dock owner was asked if any member or guest of the household participated in one or more recreation trips associated with the dock or with the boat in the marina slip during the previous seven days. If the answer was "yes," use information was collected for those trips. That is, the affirmative response was followed by questions which measured (a) the number of trips taken during the previous seven days, (b) the number of people involved in each trip, and (c) the types of recreation activities in which household members engaged during each trip.

In addition, the respondent was asked to return his or her previously mailed trip expenditure questionnaire (Appendix C) to Michigan State University's Department of Park and Recreation Resources for coding and analysis. This questionnaire contained the trip-related expenditures incurred for all recreation trips that took place the previous seven days. As in the developed areas study, the questionnaire asked for trip expenses for as many as 33 items during the previous week. The difference was that the marina user/dock owner questionnaire obtained the sum of trip expenditures for all trips during an entire week, whereas the developed site questionnaire obtained such data for each trip.

### **Trip Spending Analysis**

Households were asked to report the dollar amount spent per applicable item within 30 miles of their dock or marina slip and outside 30 miles. These "local" and "nonlocal" spending figures were summed to derive a total trip spending estimate.

Estimates of average trip expenditures in all tables are based on the full sample, including parties who spent nothing on a given item. The mail-back expense questionnaire (Appendix C) was designed to distinguish between those who actually spent nothing on a particular item and those who intentionally or unintentionally left a response blank. The mean including zeros is the appropriate statistic to multiply times total visitation to estimate total trip spending. Thus, spending means for the full sample, including zeros, are reported.

The SPSS-PC Data Entry (DE) II system developed for the UMRS developed areas study was modified and used to code, clean and edit the mailback questionnaire data. The DE II system identified out-of-range values for questionnaire variables. In addition, a number of within-range but extremely large outliers were identified. These large outliers, which were dropped from further analyses, resulted from respondents reporting annual or seasonal expenses rather than expenditures for the previous week. These outliers were typically ascertained by the units written by the respondents (e.g., \$3,000 "per year", \$1,500 "all summer"). Furthermore, respondents sometimes filled the open-ended "other" expenditure category (item H.5.a.,b.,c. in the mailback questionnaire) with items and expenditures clearly not related to recreation trips. This situation was particularly true for dock owners. Examples

included lawn maintenance, home maintenance, and tools. These items were deleted from the trip expenditure analysis

Once cleaned and coded, the weekly expenditures for all dock owner and slip renter trips were divided, respectively, by the average number of recreation trips the previous week incurred by dock owners (2.2 trips/week) and slip renters (1.9 trips/week). The number of recreation trips was obtained from the telephone, follow-up interviews (Appendix B). These computations converted the weekly expenditures to a per trip basis. No attempt was made to partition trips into day use versus overnight categories. Follow-up telephone interviews distinguished between day and overnight trips the previous week, but the mailback questionnaire did not, and, as indicated below, merging the two data sets was deemed to be inappropriate. The mailback questionnaire obtained trip expenditures on a weekly basis, and provided no valid way to allocate expenses to either day or overnight trips. Ad hoc procedures for dividing trip expenditures into day and overnight categories would be questionable and, worse yet, would result interpretation difficulties stemming from small sample sizes.

An alternative analytical procedure for computing weekly trip expenditures on a per trip basis was initially planned. Certain variables (i.e., identification number and date) were duplicated in the follow-up telephone interview and mailback questionnaire so that the two databases could be merged at a later date. The plan was to use the merged data set to derive expenditures on a per trip basis by dividing the weekly expenditures for a given case by the matched number of trips incurred that week by the identical case. However, the merger of data sets was deemed to be invalid due the large number of either missing or inconsistently coded identification numbers and dates. Approximately only half of the dock owner or marina user questionnaires and corresponding follow-up telephone interviews could be successfully merged. Trip spending means from the cases that were successfully merged were compared to the means from full sample reporting weekly expenditures, and some substantial differences in spending patterns were revealed. Differences between the two samples were greatest for boat-related expenses. Thus, the decision was made to employ the full sample data set (all mailback questionnaires reporting trip spending) and divide average weekly expenditures by sample averages of the number of trips per week in order to convert to units of expenditures per party per trip.



### Durable Goods Analysis

Spending on durable goods was measured in the profile interview (Appendix A) portion of this study. The panel was asked to report the amount spent during any year on durable goods associated with the recreational use of their boat docks or marina slips. For each major durable item (Appendix A), the type, year of purchase, cost, county of purchase, and whether the item was purchased new or used was measured.

The 32 durable goods categories (merged to 26 for analysis due to missing data for some categories) were selected to insure maximum compatibility with IMPLAN-PC sectors. The separation of spending into "new" vs. "used" also insures consistency with IMPLAN-PC requirements. In economic impact analysis, only new purchases create sales and jobs in manufacturing sectors. Purchases of used items contribute to the retail margin if bought from dealers and provide income directly to households if purchased privately.

The location of purchase was coded as county or city names. At MSU, these names were edited and recoded into county FIPS codes.

The goal of the durable goods analysis was to compute spending in IMPLAN-compatible units which could be expanded to the total population of dock owners and marina users. Therefore, the units derived were dollars per household per year. Spending expressed in these units can be multiplied by the total number of dock owners or marina slip renters per year to obtain an annual estimate of total spending on durable goods associated with trips to the UMRS. "Associated with" is highlighted because one cannot assume that durable goods are used solely in conjunction with trips to the UMRS and nowhere else. This point is addressed further in the limitations portion of the DISCUSSION section.

To compute durable goods spending means, items purchased in the last seven years were included, but the resulting estimates were divided by seven to convert the means to an annual basis. As in the developed areas study, the choice of a seven year period for durable goods was based upon the examination of results from (a) all purchases in all years, (b) durable goods purchased within the past seven years, and (c) durable goods bought within the past year. Using seven years of data provides a larger sample of durable goods than the one-year data. For both panels, the sample of items purchased within the past year was particularly weak for estimating purchases of boats and fishing equipment. For marina users, the sample of hunting, camping, and

other items purchased within the past year was nearly zero. The seven-year analysis also avoids the inclusion of items purchased many years ago at presumably lower prices. Thus, the analysis distributes the costs of durable goods evenly across seven years under the assumption that the past year is representative of the number of trips per year to the UMRS for each household.

A further advantage of the seven year period is its consistency with the on-site data base. In the developed site durable goods analysis, a six year time period was chosen: 1985 to 1990. The dock owner/marina user study was conducted one year later than the developed site study. Thus, the seven year time period spans the years: 1985 to 1991. This means that the beginning year is the same in the two data sets and that the number of years for which durable goods are analyzed are nearly identical.

For both dock owners and marina users, a number of households (dock owners in particular) reported multiple years of spending for various items. For example, one household reported buying a total of 5 fishing rods and reels between 1970 and present. If the multiple year time frame was clearly outside the seven year period of 1985 to 1991 as in the above example, then the items were dropped from analysis. However, if the multiple year time frame fell within the seven year period, the items were included.

Durable goods cost estimates will be somewhat conservative as they were not adjusted for price increases over the seven year period. Based on IMPLAN deflators for relevant durable goods sectors, changes in durable goods prices from 1985 to 1991 were less than 5 percent.

#### **Residents versus Nonresidents**

For the purposes of this study and subsequent analyses, "residents" were defined as those households who, during the profile interviews (Appendix A) reported their permanent address as being within one of the UMRS border counties. Based on this definition, 108 dock owners were UMRS residents; 42 were nonresidents. For marina users, there were 104 UMRS residents and 47 nonresidents.

In the following sections, results are presented separately for dock owners and marina slip renters. For each user type, there are three major categories of results: sample sizes and response rates, trip expenditures, and durable goods spending.

## RESULTS: DOCK OWNERS

### Sample Sizes and Response Rates

The study plan called for the other contractor to attempt 10 follow-up phone calls to the 150 households that constituted the panel of dock owners along the UMRS. Thus, the total number of possible telephone contacts was 1500. As indicated in Table 1, 1407 contacts were actually attempted. Of these attempted contacts, 361 telephone calls (26%) resulted in dock owners reporting at least one recreation trip the previous week; 243 mailback questionnaires were received from this group, yielding a response rate of 67 percent.

Table 1. Dock owner sample sizes and response rates (UMRS study, 1990-91).

A.	# Households	150	
B.	# Calls/Household	10	(1)
C.	Total Possible Contacts (A. X B.)	1500	
D.	Actual # Attempted Contacts	1407	
E.	# Recreation Trips the Previous Week	361	
F.	% "Hits" (E./D.)	26 %	(2)
G.	# Mailback Q'naires Received	484	(3)
H.	# Mailback Q'naires Reporting a Recreation Trip the Previous Week	243	
I.	Mailback Response Rate (H./E.)	67 %	

#### Notes:

- (1) 3 calls each in spring, summer, fall; 1 call in winter
- (2) % of contacts for which there was a recreation trip the previous week
- (3) Exceeds # reporting recreation trips the previous week (Part E.) because, part way through the study, households were asked to return their mailback questionnaires even if they incurred no recreation trips the previous week

The 243 mailback trip expenditure questionnaires comprise the sample size upon which subsequent dock owner trip spending profiles are constructed. A few of these 243 questionnaires reported having engaged in at least one recreation trip the previous week, but reported no trip expenditures. These questionnaires with recreation trips but no reported expenditures were included in the analysis.

### **Trip Expenditures**

Dock owners averaged \$86 in variable trip costs per party per trip (Table 2). Eighty-one percent (81%) of these expenditures were made within 30 miles of the boat dock.

Proportion of Zero Spending. In most of the categories (Table 2), less than 10 percent of the sample of dock owners reported any spending. Categories with relatively high percentages of non-zero spending by dock owners were: grocery (35%), restaurant (50%), auto/RV gas and oil (41%), boat gas and oil (23%), fishing bait (50%), and film purchasing (72%).

Trip Spending by Category. The \$86 per trip average for dock owners across 33 specific trip expense categories and 8 aggregate groupings displayed an uneven distribution. The largest proportion of spending was for food and beverages (36%) and boat-related items (31%), followed by auto/RV (11%), miscellaneous (11%), lodging (4%), activity fees (3%), and fishing and hunting (2% each) (Table 2B). Spending profiles in 33 detailed trip spending categories are reported in Table 2A.

Resident vs. Nonresident Spending. Table 3 contains the results pertaining to trip spending by origin of visitor (i.e., resident vs. nonresident) and location of spending (i.e., within 30 miles of the dock location vs. outside 30 miles). The spending by nonresidents within the UMRS is necessary for IMPLAN-PC estimates of the economic impacts of dock owner spending. Due to the inability to merge profile and mailback data sets electronically as described earlier, a resident or nonresident code was added manually to the mailback cases in the data set.

Table 2A. Average trip spending (\$ per party per trip) for 33 detailed mailback expenditure items.  
UMRS Dock Owners Study (1990-91), n=243.

Item	Mean		Mean		Within 30 Mi.		Outside 30 Mi.	
	per Week	Pct. Zeroes	per Trip	Pct. Item In Total	Mean/Trip	Pct.	Mean/Trip	Pct.
<b>LODGING</b>								
Hotel	7.37	96%	3.35	4%	0.27	8%	3.08	92%
Campgrounds	0.75	98%	0.34	*	0.16	47%	0.18	53%
<b>FOOD AND BEVERAGE</b>								
Grocery	34.84	35%	15.84	18%	14.13	89%	1.70	11%
Restaurant	33.42	50%	15.19	18%	13.13	86%	2.06	14%
<b>AUTO/RV</b>								
Auto/RV gas & oil	14.23	41%	6.47	8%	4.43	68%	2.04	32%
Auto/RV rental	1.40	99%	0.64	1%	0.45	71%	0.19	29%
Auto/RV repairs	0.65	93%	0.30	*	0.26	88%	0.04	12%
Auto/RV tires	3.25	96%	1.48	2%	1.40	95%	0.08	5%
Auto/RV parts	0.87	98%	0.40	*	0.40	100%	0.00	0%
Auto/RV parking & tolls	0.22	98%	0.10	*	0.05	55%	0.05	45%
<b>BOAT-RELATED</b>								
Boat gas & oil	20.38	23%	9.26	11%	8.10	87%	1.17	13%
Boat rental	4.12	100%	1.87	2%	0.00	0%	1.87	100%
Boat repairs	26.87	87%	12.21	14%	11.88	97%	0.33	3%
Boat parts	7.38	93%	3.35	4%	2.47	74%	0.88	26%
Boat launch fees	0.78	95%	0.35	*	0.22	63%	0.13	37%
Boat fares	0.02	100%	0.01	*	0.01	100%	0.00	0%
<b>FISHING</b>								
Fishing license	0.19	99%	0.09	*	0.09	100%	0.00	0%
Boat charter fee	0.00	100%	0.00	0%	0.00	0%	0.00	0%
Fishing bait	4.42	50%	2.01	2%	1.73	86%	0.28	14%
<b>HUNTING</b>								
Hunting license	0.15	99%	0.07	*	0.07	100%	0.00	0%
Ammunition	3.06	91%	1.39	2%	1.11	80%	0.28	20%
<b>ACTIVITY FEES</b>								
Equipment rental	1.14	97%	0.52	1%	0.42	81%	0.10	19%
Guide fees	0.00	99%	0.00	0%	0.00	0%	0.00	0%
Spectator sports fee	0.46	98%	0.21	*	0.16	76%	0.05	24%
Tourist attraction fee	0.16	99%	0.07	*	0.07	100%	0.00	0%
Other recreation fee	3.02	91%	1.37	2%	1.37	100%	0.00	0%
<b>MISCELLANEOUS</b>								
Film purchasing	2.68	72%	1.22	1%	1.02	84%	0.20	16%
Film developing	1.76	84%	0.80	1%	0.56	70%	0.24	30%
Souvenirs	1.62	95%	0.74	1%	0.46	63%	0.27	37%
Footwear	2.96	95%	1.35	2%	1.25	93%	0.10	7%
Men's clothing	3.49	94%	1.59	2%	1.49	94%	0.10	6%
Women's clothing	2.28	91%	1.04	1%	0.89	86%	0.15	14%
All Other	5.21	92%	2.37	3%	1.84	78%	0.53	22%

Notes: 1. Means based on n=243, the number of mailback questionnaires for which recreation expenditures the previous week were reported.

2. "Mean per trip" = "Mean per week" divided by 2.2 trips per week, the sample average.

3. "Pct. Zeroes" = % of dock owners who spent nothing on a particular item on a particular trip.

4. (\*)=Less than 0.5%.

Table 2B. Average trip spending (\$ per party per trip) for 8 aggregate spending categories.  
UMRS Dock Owners Study (1990-91), n=243.

Item	Mean per Week		Mean per Trip		Within 30 Mi.		Outside 30 Mi.	
	Zeroes	Pct.	Pct Item	In Total	Mean/Trip	Pct.	Mean/Trip	Pct.
LODGING	8.12	95%	3.89	4%	0.43	12%	3.26	88%
FOOD AND BEVERAGE	68.26	26%	31.03	36%	27.26	88%	3.76	12%
AUTO/RV	20.62	40%	9.37	11%	6.98	74%	2.39	26%
BOAT-RELATED	59.55	21%	27.07	31%	22.68	84%	4.39	16%
FISHING	4.60	50%	2.09	2%	1.82	87%	0.27	13%
HUNTING	3.21	91%	1.46	2%	1.18	81%	0.28	19%
ACTIVITY FEES	4.77	87%	2.17	3%	2.02	93%	0.15	7%
MISCELLANEOUS	19.99	68%	9.09	11%	5.67	82%	3.42	38%
Total	189.13	0%	85.97	100%	69.89	81%	16.08	19%

Notes: 1. Means based on n=243, the number of mailback questionnaires for which recreation expenditures the previous week were reported.

2. "Mean per trip" = "Mean per week" divided by 2.2 trips per week, the sample average.

3. "Pct.Zeroes" =% of dock owners who spent nothing on a particular item on a particular trip.

4. (\*)=Less than 0.5%.

Average trip spending was \$78 per party per trip for resident dock owners and \$98 per party per trip for nonresidents (Table 3B). The average for residents and nonresidents combined was \$86 per party per trip (Table 2B).

Resident and nonresident spending patterns differ. First, nonresidents, as compared to residents, spend a higher proportion of their total trip costs on lodging (9% vs. 3%, respectively) and food and beverage (40% vs. 35%, respectively). Residents' percentages of total spending are higher than nonresidents for all remaining categories except "auto/RV" for which there is a tie (11% each). Secondly, nonresidents spend proportionately lower average amounts per party trip within 30 miles of the dock location than residents (\$64 vs. \$67 or 66% vs. 86% of total spending). Residents spend more per party trip than nonresidents within 30 miles for most items except for food and beverage (nonresidents' average is higher than residents') and fishing-related items (a tie).

Errors in Estimates of Trip Spending. In Table 4, sampling errors associated with trip spending estimates are provided. The "percent error" is the standard error divided by the mean and multiplied by 100. Presenting the standard

Table 3A. Average trip spending (\$ per party per trip) by dock owner residents and nonresidents for 33 detailed mailback expenditure items, n=229.

Item	Residents (n=169)			Nonresidents (n=60)		
	In 30	Out 30	Total	In 30	Out 30	Total
Hotel	0.29	1.33	1.62	0.30	8.71	9.01
Campgrounds	0.23	0.26	0.49	0.00	0.00	0.00
Grocery	12.25	1.05	13.30	17.10	3.86	20.97
Restaurant	12.30	1.88	14.17	15.72	2.61	18.33
Auto/RV gas & oil	4.12	1.06	5.18	4.39	5.14	9.52
Auto/RV rental	0.65	0.27	0.91	0.00	0.00	0.00
Auto/RV repairs	0.30	0.00	0.30	0.00	0.16	0.16
Auto/RV tires	1.60	0.11	1.70	1.18	0.00	1.18
Auto/RV parts	0.55	0.00	0.55	0.06	0.00	0.06
Auto/RV parking & tolls	0.08	0.06	0.14	0.00	0.00	0.00
Boat gas & oil	7.78	1.23	9.00	8.30	1.27	9.57
Boat rental	0.00	0.00	0.00	0.00	7.58	7.58
Boat repairs	10.58	0.00	10.58	6.00	1.10	7.10
Boat parts	2.75	1.26	4.01	1.25	0.00	1.25
Boat launch fees	0.31	0.16	0.48	0.00	0.08	0.08
Boat fares	0.00	0.00	0.00	0.04	0.00	0.04
Fishing license	0.12	0.00	0.12	0.00	0.00	0.00
Boat charter fee	0.00	0.00	0.00	0.00	0.00	0.00
Fishing bait	1.70	0.30	2.00	1.82	0.24	2.05
Hunting license	0.10	0.00	0.10	0.00	0.00	0.00
Ammunition	1.54	0.04	1.58	0.19	1.00	1.19
Equipment rental	0.36	0.14	0.50	0.45	0.00	0.45
Guide fees	0.00	0.00	0.00	0.00	0.00	0.00
Spectator sports fee	0.19	0.07	0.26	0.11	0.00	0.11
Tourist attraction fee	0.10	0.00	0.10	0.00	0.00	0.00
Other recreation fee	1.30	0.00	1.30	0.68	0.00	0.68
Film purchasing	1.01	0.19	1.20	1.00	0.26	1.26
Film developing	0.58	0.19	0.76	0.46	0.41	0.88
Souvenirs	0.48	0.27	0.75	0.54	0.34	0.88
Footwear	1.63	0.15	1.78	0.00	0.00	0.00
Men's clothing	1.45	0.14	1.59	1.30	0.01	1.31
Women's clothing	1.00	0.21	1.21	0.76	0.00	0.76
All Other	1.69	0.63	2.32	2.69	0.38	3.07

Notes: 1. Sample size is slightly smaller here than in Table 2 due to missing identification numbers.

2. "In 30 /Out 30" = Within and outside 30 miles of the dock.

3. (\*)=Less than 0.5%.

Table 3B. Average trip spending (\$ per party per trip) by dock residents and nonresidents for 8 aggregate mailback spending items, n=229.

Item	Residents (n=169)					Nonresidents (n=60)				
	In 30	Out 30	Total	% Item in Total	Pct. Error	In 30	Out 30	Total	% Item in Total	Pct. Error
LODGING	0.52	1.59	2.11	3%	41%	0.30	8.71	9.01	9%	85%
FOOD AND BEVERAGE	24.54	2.94	27.48	35%	14%	32.83	6.48	39.30	40%	14%
AUTO/RV	7.29	1.50	8.79	11%	16%	5.63	5.30	10.92	11%	20%
BOAT-RELATED	21.41	2.66	24.07	31%	28%	15.58	10.02	25.60	26%	36%
FISHING	1.81	0.30	2.12	3%	15%	1.82	0.24	2.05	2%	22%
HUNTING	1.64	0.04	1.68	2%	37%	0.19	1.00	1.19	1%	78%
ACTIVITY FEES	1.95	0.21	2.16	3%	32%	1.25	0.00	1.25	1%	45%
MISCELLANEOUS	6.14	1.15	7.29	9%	29%	4.06	1.03	5.09	5%	27%
Total	66.99	11.03	78.02	100%	14%	64.35	33.15	97.5	100%	21%

Notes: 1. Sample size is slightly smaller here than in Table 2 due to missing identification numbers.

2. "In 30/Out 30" = Within and outside 30 miles of the dock.

3. Pct. Error=Standard error of the mean as a percentage of the mean.

4. (\*)=Less than 0.5%.

error as a percentage aids in interpretation of variance. For example, Table 4B indicates, that for all 243 cases, the error associated with the lodging mean is slightly more than twice the error associated with the activity fees mean: 54 percent vs. 26 percent, respectively.

In Table 4, the standard error is computed for weekly expenses rather than for expenditures per trip. The standard error for the estimate of total trip spending by dock owners is plus or minus 11 percent of the mean of \$189.13 per week. The 95 percent confidence interval for the mean is two standard errors on either side of the mean. Thus, the 95 percent confidence interval for the overall trip spending estimate is between \$146.37 and \$231.89 per party per week (\$67 to \$105 per party per trip applying the same 11 percent standard error to the \$86 per party per trip average in Table 2).

The standard errors for trip spending estimates by aggregate category (Table 4B) range from 10 percent (food and beverage) to 54 percent (lodging). The larger standard errors associated with lodging and hunting expenses are primarily a function of high variance and large proportions of zero spending in these categories (95% and 91%, respectively, in Table 2B).



Table 4A. Selected error statistics for trip spending per week by detailed expenditure items, UMRS Dock Owners Study (1990-91), n=243.

Item	Total	Std.	Pct.	95% CI	
	Mean	Error	Error	Mean-	Mean+
Hotel	7.37	4.31	58%	(0)	15.99
Campgrounds	0.75	0.38	51%	(0)	1.51
Grocery	34.84	3.13	9%	28.58	41.10
Restaurant	33.42	4.33	13%	24.76	42.08
Auto/RV gas & oil	14.23	1.44	10%	11.35	17.11
Auto/RV rental	1.40	1.04	74%	(0)	3.48
Auto/RV repairs	0.65	0.20	31%	0.25	1.05
Auto/RV tires	3.25	1.35	42%	0.55	5.95
Auto/RV parts	0.87	0.63	72%	(0)	2.13
Auto/RV parking & tolls	0.22	0.10	45%	0.02	0.42
Boat gas & oil	20.38	2.41	12%	15.56	25.20
Boat rental	4.12	4.12	100%	(0)	12.36
Boat repairs	26.87	10.25	38%	6.37	47.37
Boat parts	7.38	3.74	51%	(0)	14.86
Boat launch fees	0.78	0.32	41%	0.14	1.42
Boat fares	0.02	0.02	100%	(0)	0.06
Fishing license	0.19	0.17	89%	(0)	0.53
Boat charter fee	0.00	0.00	0%	0.00	0.00
Fishing bait	4.42	0.52	12%	3.38	5.46
Hunting license	0.15	0.11	73%	(0)	0.37
Ammunition	3.06	1.07	35%	0.92	5.20
equipment rental	1.14	0.52	46%	0.10	2.18
Guide fees	0.00	0.00	0%	0.00	0.00
Spectator sports fee	0.46	0.21	46%	0.04	0.88
Tourist attraction fee	0.16	0.14	88%	(0)	0.44
Other recreation fee	3.02	1.11	37%	0.80	5.24
film purchasing	2.68	0.50	19%	1.68	3.68
Film developing	1.76	0.47	27%	0.82	2.70
Souvenirs	1.62	0.86	53%	(0)	3.34
Footwear	2.96	0.94	32%	1.08	4.84
Men's clothing	3.49	1.23	35%	1.03	5.95
Women's clothing	2.28	1.14	50%	0.00	4.56
All Other	5.21	1.78	34%	1.65	8.77
Total	189.13	21.38	11%	146.37	231.89

Pct.Error: Standard error of the mean as a percentage of the mean. Two standard errors yield a 95% confidence interval (CI).

Table 4B. Selected error statistics for trip spending per week by 8 aggregate spending categories, UMRS Dock Owners Study (1990-91), n=243.

Item	Total Mean	Std. Error	Pct. Error	95% CI	
				Mean-	Mean+
LODGING	8.12	4.36	54%	(0)	16.84
FOOD AND BEVERAGE	68.26	6.70	10%	54.86	81.66
AUTO/RV	20.62	2.45	12%	15.72	25.52
BOAT-RELATED	59.55	12.66	21%	34.23	84.87
FISHING	4.60	0.56	12%	3.48	5.72
HUNTING	3.21	1.08	34%	1.05	5.37
ACTIVITY FEES	4.77	1.25	26%	2.27	7.27
MISCELLANEOUS	19.99	5.12	26%	9.75	30.23
TOTAL	189.13	21.38	11%	146.37	231.89

Pct. Error: Standard error of the mean as a percentage of the mean. Two standard errors yield a 95% confidence interval (CI).

#### Durable Goods Spending

Within the past year, dock owners spent an average of \$668 per household on durable items that were used for recreation trips associated with the use of their docks (Table 5). Ninety percent (90%) of this amount, \$602 per household per year, was spent on boat-related durable goods. The remainder of the \$668 in durable goods spending was distributed as: \$38 (6%) for fishing gear, \$17 (3%) for hunting gear, \$7 (1%) for camping equipment, and \$4 (0.6%) for all other durable recreation equipment. Seventy-four percent (74%), \$496 per household per year, was spent on motorized boats alone.

Durable Goods Spending by Item. The sample of 150 dock owners reported 2,890 durable items used for recreation purposes (Table 5). About 26% of the items reported were major durable goods such as boats, engines, trailers, rifles, and tents. Among these major durable items, thirteen percent (13%) were boats and engines alone. Seven percent (7%) were rifles and shotguns used in hunting; 4 percent were tents.

Seventy-four percent (74%) of all durable goods were smaller items like fishing tackle, hunting equipment, and boating and camping accessories.

Table 5. Spending on durable goods by type, UMRS dock owners (150 households).

Category	ALL ITEMS ALL YEARS		ITEMS PURCHASED IN LAST 7 YEARS						
	N	\$\$ per Item	N	\$\$ per Item	Tot. Cost \$(000's)	Pct of Total \$	Pct of Subgp.	\$\$ per Household	\$\$ per Household per Year
Motor boat	216	3743.42	99	5255.83	520.33	74%	82%	3468.85	495.55
Non-Motorized boat	40	1016.89	15	626.50	9.40	1%	1%	62.65	8.95
Rubber boat	6	116.50	5	58.80	0.29	*	0%	1.96	0.28
Jet ski	4	1999.88	4	2000.25	8.00	1%	1%	53.34	7.62
Sailboat	6	2883.25	1	199.50	0.20	*	0%	1.33	0.19
Boat engines	93	1415.77	38	1893.87	71.97	10%	11%	479.78	68.54
Boat trailer	35	543.43	12	520.63	6.25	1%	1%	41.65	5.95
Waterski	135	145.48	39	254.69	9.93	1%	2%	66.22	9.46
Boat accessories	82	95.62	60	96.25	5.78	1%	1%	38.50	5.50
BOAT TOTAL	617	1707.33	273	2315.54	632.14	90%	100%	4214.28	602.04
Rods & reels	1124	44.79	425	51.04	21.69	3%	54%	144.62	20.66
Nets, traps	225	5.70	221	3.33	0.74	*	2%	4.90	0.70
Depth finders	71	237.95	35	311.10	10.89	2%	27%	72.59	10.37
Fishing clothing	131	27.33	45	54.37	2.45	*	6%	16.31	2.33
Boots & waders	112	51.12	37	113.23	4.19	1%	10%	27.93	3.99
FISH TOTAL	1663	46.80	763	52.36	39.95	6%	100%	266.35	38.05
Rifles	193	339.08	18	460.83	8.30	1%	47%	55.30	7.90
Bows & arrows	12	223.75	3	234.50	0.70	*	4%	4.69	0.67
Hand load equip.	15	174.60	4	283.50	1.13	*	6%	7.56	1.08
Hunting boots	49	46.32	39	41.73	1.63	*	9%	10.85	1.55
Rubber boots	21	43.57	21	43.50	0.91	*	5%	6.09	0.87
Hunting clothing	75	96.86	48	101.94	4.89	1%	28%	32.62	4.66
HUNT TOTAL	365	222.45	133	132.08	17.57	3%	100%	117.11	16.73
Tents	120	82.79	29	121.66	3.53	1%	46%	23.52	3.36
Other camp	27	492.00	9	451.50	4.06	1%	54%	27.09	3.87
CAMP TOTAL	147	157.95	38	199.78	7.59	1%	100%	50.61	7.23
Recreation equip.	24	88.56	16	93.84	1.50	*	32%	10.01	1.43
Other rec. goods	74	79.86	68	46.48	3.16	*	68%	21.07	3.01
ALL OTHER EQUIP.	98	81.99	84	55.50	4.66	1%	100%	31.08	4.44
ALL ITEMS TOTAL	2890	430.34	1291	543.70	701.91	100%		4679.43	668.49

Notes: 1. Since small sample sizes were incurred for many items purchased within the past year only, samples sizes for items were increased by computing means for purchases made during the past 7 years.

2. "\$\$ per household per year" computed by dividing \$\$ per household (previous 7 years) by 7.

3. (\*)=Less than 0.5%.

Fishing rods and reels, other fishing gear, and waterskis constituted the majority of smaller items.

Of the 2,890 items purchased by dock owners, 20 percent were purchased within the past year and 45 percent were purchased within the previous seven years. These 20 percent and 45 percent figures are somewhat conservative since items purchased in multiple years were excluded from the one-year and seven-year analyses but not from the analysis for all items in all years (this data editing step was discussed in the PROCEDURES section above).

Durable Goods Spending by Location and Residence. About 75 percent of the \$668 in durable goods spending, \$502 per household per year, took place within the UMRS (Table 6). UMRS residents accounted for approximately two-thirds (66%) of all durable goods spending anywhere and 77 percent of such spending within the UMRS. Residents were more likely to buy durable goods within the region than nonresidents. Eighty-nine percent (89%) of resident durable goods spending occurred within the UMRS as compared to 54% for nonresidents.

Of the \$502 per household spent within the UMRS region, \$454 was spent on boats and boating equipment, \$28 on fishing gear, \$14 on hunting gear, \$4 on camping equipment, and \$3 on other recreation durable goods. Across durable items, with the exception of hunting gear, three fourths or more of all spending occurred within the UMRS. Fifty-seven percent (57%) of all spending on hunting gear occurred within the UMRS (Table 6).

Residents spent an average of \$600 per household per year on durable goods, whereas nonresidents spent an average of \$781 (Table 6). Both resident and nonresident durable goods spending was dominated by boats and boat-related durable goods (88% and 92% of total durable goods spending, respectively). However, within individual items and categories, there were some noticeable differences. For example, residents spent more per household than nonresidents on boat engines (\$87 vs. \$21), water skis (\$12 vs. \$2), fishing gear (\$40 vs. \$32), and hunting gear (\$20 vs. \$9). Nonresidents spent more on the average than residents for all types of boats and camping equipment other than tents.

New vs. Used Durable Goods Spending. In the past seven years, dock owners purchased 979 new and 312 used recreation durable goods used in conjunction with their boat docks (Table 7). Sixty-four percent (64%) of total spending

Table 6. Durable spending by place of purchase and place of residence (\$ per household per year),  
UMRS Dock owners.

Category	ALL SPENDING				WITHIN UMRS			
	UMRS Resident n=108	Non- resident n=42	Total n=150	Pct. Resident to Total	UMRS Resident n=108	Non- resident n=42	Total n=150	Pct. Resident to Total
Motor boat	413.20	643.02	495.55	62%	370.67	367.51	369.79	72%
Non-Motorized boat	2.58	25.34	8.95	21%	1.79	1.02	1.57	82%
Rubber boat	0.40	0.00	0.28	100%	0.40	0.00	0.28	100%
Jet ski	3.97	17.01	7.62	38%	3.97	10.54	5.81	49%
Sailboat	0.26	0.00	0.19	100%	0.26	0.00	0.19	100%
Boat engines	87.12	20.75	68.54	92%	77.67	14.29	59.92	93%
Boat trailer	4.76	9.01	5.95	58%	4.56	3.74	4.33	76%
Waterski	12.34	2.06	9.46	94%	10.36	1.29	7.82	95%
Boat accessories	5.65	5.10	5.50	74%	5.54	0.20	4.05	99%
BOAT TOTAL	530.28	722.29	602.04	65%	475.22	398.59	453.76	75%
Rods & reels	22.19	16.73	20.66	77%	20.32	7.48	16.73	87%
Nets, traps	0.92	0.13	0.70	95%	0.67	0.09	0.50	95%
Depth finders	10.74	9.42	10.37	75%	5.46	2.57	4.65	85%
Fishing clothing	1.70	3.94	2.33	53%	1.63	3.50	2.16	54%
Boots & waders	4.88	1.68	3.99	88%	4.43	1.11	3.50	91%
FISH TOTAL	40.43	31.90	38.05	77%	32.51	14.75	27.54	85%
Rifles	10.31	1.70	7.90	94%	10.31	1.70	7.90	94%
Bows & arrows	0.21	1.84	0.67	23%	0.21	1.19	0.49	31%
Hand load equip.	1.51	0.00	08	100%	1.31	0.00	0.94	100%
Hunting boots	1.70	1.16	1.55	79%	0.97	0.00	0.70	100%
Rubber boots	0.67	1.38	0.87	56%	0.51	0.20	0.42	87%
Hunting clothing	5.15	3.40	4.66	80%	4.86	0.68	3.69	95%
HUNT TOTAL	19.55	9.48	16.73	84%	18.17	3.77	14.14	93%
Tents	4.23	1.12	3.36	91%	4.23	0.10	3.08	99%
Other camp	0.19	13.33	3.87	4%	0.19	1.28	0.49	28%
CAMP TOTAL	4.42	14.45	7.23	44%	4.42	1.38	3.57	89%
Recreation equip.	0.89	2.84	1.43	45%	0.89	0.26	0.71	90%
Other rec. goods	4.18	0.00	3.01	100%	3.72	0.00	2.68	100%
ALL OTHER EQUIP.	5.07	2.84	4.44	82%	4.61	0.26	3.39	98%
ALL ITEMS TOTAL	599.75	780.96	668.49	66%	534.93	418.75	502.40	77%

Table 7. Durable spending on new versus used goods by type (items purchased in last 7 years),  
UMRS Dock Owners.

Category	NEW			USED			Pct. new of total \$\$ per Item
	N	\$\$ per Item	Total Cost \$(000's)	N	\$\$ per Item	Total Cost \$(000's)	
Motor boat	51	7067.53	360.44	48	5484.50	263.26	58%
Non-Motorized boat	5	1640.10	8.20	10	240.45	2.40	77%
Rubber boat	5	58.80	0.29	0	0.00	0.00	100%
Jet ski	2	3050.25	6.10	2	1900.50	3.80	62%
Sailboat	0	0.00	0.00	1	399.00	0.40	0%
Boat engines	30	2251.90	67.56	8	1038.19	8.31	89%
Boat trailer	8	594.56	4.76	4	635.25	2.54	65%
Waterski	34	259.10	8.81	5	449.40	2.25	80%
Boat accessories	60	96.25	5.78	0	0.00	0.00	100%
Rods & reels	404	52.40	21.17	21	13.00	0.27	99%
Nets, traps	13	22.62	0.29	208	4.24	0.88	25%
Depth finders	35	311.10	10.89	0	0.00	0.00	100%
Fishing clothing	45	33.37	1.50	0	0.00	0.00	100%
Boots & waders	36	54.25	1.95	1	136.50	0.14	93%
Rifles	16	508.59	8.14	2	78.75	0.16	98%
Bows & arrows	3	234.50	0.70	0	0.00	0.00	100%
Hand load equip.	4	283.50	1.13	0	0.00	0.00	100%
Hunting boots	39	41.73	1.63	0	0.00	0.00	100%
Rubber boots	21	43.50	0.91	0	0.00	0.00	100%
Hunting clothing	48	101.94	4.89	0	0.00	0.00	100%
Tents	29	121.66	3.53	0	0.00	0.00	100%
Other camp	7	76.50	0.54	2	3522.75	7.05	7%
Recreation equip.	16	93.84	1.50	0	0.00	0.00	100%
Other rec. goods	68	46.48	3.16	0	0.00	0.00	100%
ALL ITEMS TOTAL	979	535.11	523.88	312	934.13	291.45	64%

was for new durable items. The used mean of \$824 per item is larger than the new mean of \$535 per item because the total average cost per item reflects both the cost and the kinds of items purchased. Higher cost items, such as boats and trailers, are more likely to be purchased used. Thus, the new durable goods average is based on a larger number and higher proportion of less expensive items than the used durable goods average. The percentages of new to total spending, which are based on total expenditures and not averages, are the most useful figures for IMPLAN analysis.

**Sampling Errors.** Sampling errors for estimates of durable goods expenses are slightly higher than for trip spending. These larger errors are due to smaller sample sizes and greater variance for the cost of durable items. As a percentage of the mean, standard errors for durable goods are 13 percent overall and 15 percent for spending within the UMRS (Table 8).

Errors are larger for some individual item categories (i.e., hunting, camping, and other). However, since hunting, camping, and other durable goods account for such a small proportion of dock owner spending, these errors are not too disturbing. The estimates for boating and fishing equipment are much more accurate.

The error associated with nonresident spending is moderately large (20%). Future sampling schemes may have to increase the number of dock owners slightly to portray more accurately the amount spent by nonresidents.

**Table 8. Sampling errors for durable goods spending estimates, UMRS dock owners.**

	Mean	Std.Err	95% Confidence Interval		Pct Error
<b>TOTALS</b>					
\$\$ Per Household/Year	668.49	83.75	500.99	835.99	13%
\$\$ in Local Area	502.40	76.84	348.72	656.08	15%
<b>BY MAJOR DURABLE ITEM CATEGORIES</b>					
Boat	602.04	79.91	442.22	761.86	13%
Fish	38.05	5.89	26.27	49.83	15%
Hunt	16.73	6.00	4.73	28.73	36%
Camp	7.23	3.68	(0)	14.59	51%
Other	4.44	2.51	(0)	9.46	57%
<b>BY SEGMENTS</b>					
Residents	599.75	98.51	402.73	796.77	16%
Nonresidents	780.96	159.17	462.62	1099.30	20%

Note: Pct Error=Standard error of the mean as a percentage of the mean

Two standard errors yields a 95% confidence interval

Other Annual Expenses. UMRS dock owners averaged \$1,177 per household per year in other annual expenses (Table 9). The original cost of building the dock accounts for the preponderance (68%) of these expenses, followed by dock maintenance (18%), and boat insurance (8%). Fishing and/or hunting licenses account for less than 2 percent of other annual expenses.

Table 9. Other annual or durable goods expenses by type, UMRS dock owners.

Category	\$ per Household	Tot.Cost \$(000's)	Pct of Total	Pct of Subgp.
Hunt/Fish. License (MN)	4.51	0.68	*	16%
Hunt/Fish. License (WI)	6.75	1.01	1%	24%
Hunt/Fish. License (IL)	5.74	0.86	*	21%
Hunt/Fish. License (IA)	9.83	1.47	1%	36%
Hunt/Fish. License (MO)	0.80	0.12	*	3%
ALL Hunt/FISH. LICENSE	27.63	4.14	2%	100%
Cost of dock	797.03	119.55	68%	
Dock Maintenance	216.04	32.41	18%	
Boat Registration	14.43	2.16	1%	
Boat Storage	25.30	3.80	2%	
Boat Insurance	96.99	14.55	8%	
<b>TOTAL</b>	<b>1177.42</b>	<b>176.61</b>	<b>100%</b>	

Notes: (\*)=Less than 0.5%.

The annual costs of boat storage and boat insurance can be directly bridged to IMPLAN sectors in order to derive corresponding economic impacts. The cost of dock construction and maintenance could also be subjected to input-output analysis, but first more must be known about the economic sectors affected by these activities as well as the length of time since construction. Fishing and hunting licenses and boat registration fees are generally considered transfer payments to other units of government. Therefore, licenses and fees are excluded from local impact analyses unless some portion is returned from the state to local units of government and that portion can be ascertained.



## RESULTS: MARINA SLIP RENTERS

### Sample Sizes and Response Rates

The study plan called for the other contractor to attempt 9 follow-up phone calls to the 150 households that constituted the panel of marina slip renters along the UMRS. Thus, the total number of possible telephone contacts was 1350 (Table 10). Of these attempted contacts, 331 telephone calls (25%) resulted in slip renters reporting at least one recreation trip the previous week. Three hundred ninety-two (392) mailback questionnaires were received from this group, yielding an apparently nonsensical response rate of 119 percent.

There are two likely explanations for why more mailback questionnaires than telephone contacts pertained to slip renters who reported recreation trips and expenditures the previous week. First, although 1,350 telephone contacts were possible, not all contacts were actually made. However, since all were sent mailback questionnaires prior to the attempted contacts, a number of those who could not be contacted apparently returned their questionnaires anyway. Secondly, there were a number of telephone contacts (28) for whom no trips were reported but who returned a mailback questionnaire containing trip expenditures for the previous week.

The 395 mailback trip expenditure questionnaires comprise the sample size upon which subsequent marina user trip spending profiles are constructed. A few of these 395 questionnaires reported having engaged in at least one recreation trip the previous week, but reported no trip expenditures. These questionnaires with recreation trips but no reported expenditures were included in the analysis.

### Trip Expenditures

Marina slip renters averaged \$132 in variable trip costs per party per trip (Table 11). Eighty-five percent (85%) of these expenditures were made within 30 miles of the marina slip.

Proportion of Zero Spending. In most of the categories (Table 11), less than 10 percent of the sample of marina users reported any spending. Categories with relatively high percentages of non-zero spending by marina users were:

Table 10. Marina user sample sizes and response rates (UMRS study, 1990-91).

A. # Households	150	
B. # Calls/Household	9	(1)
C. Total Possible Contacts (A. X B.)	1350	
D. Actual # Completed Contacts	1082	
E. # Recreation Trips the Previous Week	331	
F. % "Hits" (E./D.)	30 %	(2)
G. # Mailback Q'naires Rc'd.	748	(3)
H. # Mailback Q'naires Reporting a Recreation Trip the Previous Week	395	
I. Mailback Response Rate (H./E.)	119 %	(4)

Notes:

- (1) 3 calls each in spring, summer, fall
- (2) % of contacts for which there was a recreation trip the previous week
- (3) Exceeds # of recreation trips the previous week (part E.) because, part way through the study, households were asked to return their mailback expenditure questionnaires even if they incurred no recreation trips the previous week
- (4) Exceeds 100% because part H. exceeds part E. There are two likely explanations. First, many could not be contacted by phone. Since they were sent mailback questionnaires prior to the attempted contacts (part D.), a number of those who could not be contacted returned their questionnaires anyway. Secondly, there were 28 telephone contacts for whom no trips were reported but who returned a mailback questionnaire containing trip expenditures for the previous week.

Table 11A. Average trip spending (\$ per party per trip) for 33 detailed mailback expenditure items.  
UMRS Marina Users Study (1990-91), n=395.

Item	Mean	Pct.	Mean	Pct. Item	Within 30 Mi.		Outside 30 Mi.	
	per Week	Zeros	per Trip	In Total	Mean/Trip	Pct.	Mean/Trip	Pct.
<b>LODGING</b>								
Hotel	5.16	93%	2.72	2%	1.09	40%	1.62	60%
Campgrounds	0.41	99%	0.22	*	0.22	100%	0.00	0%
<b>FOOD AND BEVERAGE</b>								
Grocery	37.39	23%	19.68	15%	16.63	85%	3.05	15%
restaurant	36.89	35%	19.42	15%	15.97	82%	3.44	18%
<b>AUTO/RV</b>								
Auto/RV gas & oil	12.20	30%	6.42	5%	4.88	76%	1.54	24%
Auto/RV rental	0.01	100%	0.01	*	0.01	100%	0.00	0%
Auto/RV repairs	1.36	94%	0.72	1%	0.69	96%	0.03	4%
Auto/RV tires	0.27	99%	0.14	*	0.14	100%	0.00	0%
Auto/RV parts	0.82	97%	0.43	*	0.38	89%	0.05	11%
Auto/RV parking & tolls	0.05	97%	0.03	*	0.03	100%	0.00	0%
<b>BOAT-RELATED</b>								
Boat gas & oil	44.68	26%	23.52	18%	19.44	83%	4.08	17%
Boat rental	0.01	100%	0.01	*	0.01	100%	0.00	0%
Boat repairs	38.75	82%	20.39	16%	19.59	96%	0.80	4%
Boat parts	23.16	73%	12.19	9%	10.14	83%	2.05	17%
Boat launch fees	21.08	88%	11.09	8%	10.50	95%	0.59	5%
Boat fares	0.15	100%	0.08	*	0.00	0%	0.08	100%
<b>FISHING</b>								
Fishing license	0.26	98%	0.14	*	0.12	88%	0.02	12%
Boat charter fee	0.00	100%	0.00	0%	0.00	0%	0.00	0%
Fishing bait	1.13	83%	0.59	*	0.56	95%	0.03	5%
<b>HUNTING</b>								
Hunting license	0.04	100%	0.02	*	0.00	0%	0.02	100%
Ammunition	0.31	99%	0.16	*	0.15	90%	0.02	10%
<b>ACTIVITY FEES</b>								
equipment rental	0.56	98%	0.29	*	0.22	73%	0.08	27%
Guide fees	0.00	100%	0.00	0%	0.00	0%	0.00	0%
Spectator sports fee	0.52	97%	0.27	*	0.08	31%	0.19	69%
Tourist attraction fee	0.67	97%	0.35	*	0.15	43%	0.20	57%
Other recreation fee	1.65	96%	0.87	1%	0.46	53%	0.41	47%
<b>MISCELLANEOUS</b>								
film purchasing	2.34	77%	1.23	1%	1.08	86%	0.17	14%
Film developing	1.69	85%	0.89	1%	0.77	87%	0.12	13%
Souvenirs	2.73	95%	1.44	1%	1.27	88%	0.17	12%
Footwear	2.31	95%	1.22	1%	1.13	93%	0.08	7%
Men's clothing	3.04	93%	1.60	1%	1.37	88%	0.23	14%
Women's clothing	4.72	92%	2.48	2%	1.89	76%	0.59	24%
All Other	5.57	91%	2.93	2%	2.83	97%	0.10	3%

Notes: 1. Means based on n=395, the number of mailback questionnaires for which recreation expenditures the previous week were reported.

2. "Mean per trip" = "Mean per week" divided by 1.9 trips per week, the sample average.

3. "Pct.Zeros" = % of dock owners who spent nothing on a particular item on a particular trip.

4. (\*)=Less than 0.5%.

Table 11B. Average trip spending (\$ per party per trip) for 8 aggregate spending categories.  
UMRS Marina Users Study (1990-91), n=395.

Item	Mean per Week	Pct. Zeroes	Mean per Trip	Pct Item In Total	Within 30 Mi.		Outside 30 Mi.	
					Mean/trip	Pct.	Mean/trip	Pct.
LODGING	5.57	93%	2.93	2%	1.31	45%	1.62	55%
FOOD AND BEVERAGE	74.28	16%	39.09	30%	32.61	83%	6.49	17%
AUTO/RV	14.71	30%	7.74	6%	6.13	79%	1.61	21%
BOAT-RELATED	127.83	17%	67.28	51%	59.67	89%	7.61	11%
FISHING	1.39	82%	0.73	1%	0.68	94%	0.05	6%
HUNTING	0.35	99%	0.18	"	0.15	80%	0.04	20%
ACTIVITY FEES	3.40	90%	1.79	1%	0.92	51%	0.87	49%
MISCELLANEOUS	22.40	68%	11.79	9%	10.32	88%	1.47	12%
Total	249.94	0%	131.55	100%	111.78	85%	19.77	15%

Notes: 1. Means based on n=395, the number of mailback questionnaires for which recreation expenditures the previous week were reported.

2. "Mean per trip" = "Mean per week" divided by 1.9 trips per week, the sample average.

3. "Pct.Zeroes" = % of dock owners who spent nothing on a particular item on a particular trip.

4. (")=Less than 0.5%.

grocery (23%), restaurant (35%), auto/RV gas and oil (30%), boat gas and oil (26%), boat parts (73%), and film purchasing (77%).

**Trip Spending by Category.** The \$132 per trip average for marina users across 33 specific trip expense categories and 8 aggregate groupings displayed an uneven distribution. The largest proportion of spending was for boat-related items (51%) and food and beverages (30%), followed by miscellaneous (9%), auto/RV (6%), and lodging (2%). Activity fees, fishing expenses, and hunting expenses each comprised one percent or less of the total (Table 11B). Spending profiles in 33 detailed trip spending categories are reported in Table 11A.

**Resident vs. Nonresident Spending.** Average trip spending was \$127 per party per trip for resident marina users and \$143 per party per trip for nonresidents (Table 12B). The average for residents and nonresidents combined was \$132 per party per trip (Table 12B).

Resident and nonresident spending patterns differ slightly. First, residents spend a higher proportion of their total trip costs than

Table 12A. Average trip spending (\$ per party per trip) by marina user residents and nonresidents for 33 detailed mailback expenditure items, n=391.

Item	Residents (n=270)			Nonresidents (n=121)		
	In 30	Out 30	Total	In 30	Out 30	Total
Hotel	0.34	1.81	2.14	2.83	1.26	4.09
Campgrounds	0.04	0.00	0.04	0.61	0.00	0.61
Grocery	15.72	3.66	19.38	18.70	1.78	20.48
Restaurant	13.52	3.68	17.20	20.95	3.02	23.97
Auto/RV gas & oil	3.72	1.17	4.89	7.42	2.30	9.72
Auto/RV rental	0.00	0.00	0.00	0.02	0.00	0.02
Auto/RV repairs	0.92	0.01	0.93	0.20	0.04	0.24
Auto/RV tires	0.19	0.00	0.19	0.03	0.00	0.03
Auto/RV parts	0.45	0.07	0.52	0.25	0.00	0.25
Auto/RV parking & tolls	0.02	0.00	0.02	0.04	0.01	0.05
Boat gas & oil	20.19	4.48	24.67	17.64	3.32	20.96
Boat rental	0.01	0.00	0.01	0.00	0.00	0.00
Boat repairs	18.67	1.17	19.84	22.31	0.00	22.31
Boat parts	12.98	2.33	15.31	4.11	1.52	5.63
Boat launch fees	7.72	0.51	8.23	17.05	0.81	17.86
Boat fares	0.00	0.00	0.00	0.00	0.26	0.26
Fishing license	0.07	0.03	0.10	0.24	0.00	0.24
Boat charter fee	0.00	0.00	0.00	0.00	0.00	0.00
Fishing bait	0.52	0.05	0.57	0.66	0.00	0.66
Hunting license	0.00	0.00	0.00	0.00	0.06	0.06
Ammunition	0.22	0.00	0.22	0.00	0.05	0.05
Equipment rental	0.21	0.09	0.30	0.24	0.05	0.29
Guide fees	0.00	0.00	0.00	0.00	0.00	0.00
Spectator sports fee	0.07	0.01	0.08	0.13	0.59	0.72
Tourist attraction fee	0.10	0.19	0.29	0.27	0.23	0.49
Other recreation fee	0.54	0.51	1.05	0.32	0.18	0.49
Film purchasing	1.19	0.19	1.38	0.74	0.15	0.89
Film developing	0.94	0.14	1.07	0.44	0.07	0.51
Souvenirs	1.24	0.14	1.38	1.37	0.22	1.59
Footwear	1.22	0.00	1.22	0.99	0.26	1.25
Men's clothing	1.68	0.11	1.79	0.72	0.00	0.72
Women's clothing	1.95	0.64	2.59	1.82	0.17	1.99
All Other	1.43	0.11	1.53	6.06	0.10	6.16

Notes: 1. Sample size is slightly smaller here than in Table 11 due to missing identification numbers.

2. "In 30 /Out 30" = Within and outside 30 miles of the marina slip.

3. (\*)=Less than 0.5%.

Table 12B. Average trip spending (\$ per party per trip) by marina user residents and nonresidents for 8 aggregate mailback spending items, n=391.

Item	Residents (n=270)					Nonresidents (n=121)				
	In 30	Out 30	Total	% Item in Total	Pct. Error	In 30	Out 30	Total	% Item in Total	Pct. Error
LODGING	0.38	1.81	2.18	2%	31%	3.44	1.26	4.70	3%	30%
FOOD AND BEVERAGE	29.24	7.34	36.58	29%	7%	39.65	4.80	44.45	31%	9%
AUTO/RV	5.29	1.25	6.54	5%	18%	7.96	2.35	10.31	7%	9%
BOAT-RELATED	59.58	8.48	68.06	54%	11%	61.12	5.91	67.02	47%	16%
FISHING	0.59	0.08	0.67	1%	23%	0.89	0.00	0.89	1%	21%
HUNTING	0.22	0.00	0.22	*	90%	0.00	0.12	0.12	*	100%
ACTIVITY FEES	0.91	0.81	1.72	1%	35%	0.95	1.05	2.00	1%	41%
MISCELLANEOUS	8.22	1.22	9.44	7%	16%	6.06	0.88	6.94	5%	28%
Total	105.85	21.08	126.94	100%	8%	126.13	16.46	142.59	100%	9%

Notes: 1. Sample size is slightly smaller here than in Table 11 due to missing identification numbers.

2. "In 30 /Out 30" = Within and outside 30 miles of the marina slip.

3. Pct. Error=Standard error of the mean as a percentage of the mean.

4. (\*)=Less than 0.5%.

nonresidents on boat-related items (54% vs. 47%, respectively) and food and beverage (40% vs. 35%, respectively). Second, resident average spending per party trip is higher than nonresidents for miscellaneous items (\$9.44 vs. \$6.94). Third, nonresident average spending is noticeably higher than resident average spending for lodging (\$4.70 vs. \$2.18), food and beverage (\$44.45 vs. \$36.58) and auto/RV (\$10.31 vs. \$6.54). Boat-related averages are nearly the same for both residents and nonresidents.

There is little difference proportionately between resident and non-resident spending within 30 miles of the marina slip location. The percentage of nonresident spending locally is slightly greater than resident spending locally (88% vs. 83%, respectively in Table 12B). Nonresident average spending per party trip within 30 miles exceed similar resident spending for most items except hunting-related and miscellaneous items.

Errors in Estimates of Trip Spending. In Table 13, sampling errors associated with trip spending estimates are reported. The standard error is computed for weekly expenses rather than for expenditures per trip. The standard error for the estimate of total trip spending by marina users is plus or minus 6 percent

Table 13A. Selected error statistics for weekly trip spending by detailed expenditure items, UMRS Marina Users Study (1990-91), n=395.

Item	Mean of Total	Std. Error	Pct. Error	95% CI	
				Mean-	Mean+
Hotel	5.16	1.18	23%	2.80	7.52
Campgrounds	0.41	0.26	63%	(0)	0.93
Grocery	37.39	2.18	6%	33.03	41.75
restaurant	36.89	2.60	7%	31.69	42.09
Auto/RV gas & oil	12.20	0.81	7%	10.58	13.82
Auto/RV rental	0.01	0.01	100%	(0)	0.03
Auto/RV repairs	1.36	0.99	73%	(0)	3.34
Auto/RV tires	0.27	0.25	93%	(0)	0.77
Auto/RV parts	0.82	0.38	46%	0.06	1.58
Auto/RV parking & tolls	0.05	0.02	40%	0.01	0.09
Boat gas & oil	44.68	3.51	8%	37.66	51.70
Boat rental	0.01	0.01	100%	(0)	0.03
Boat repairs	38.75	6.93	18%	24.89	52.61
Boat parts	23.16	3.51	15%	16.14	30.18
Boat launch fees	21.08	6.06	29%	8.96	33.20
Boat fares	0.15	0.15	100%	(0)	0.45
Fishing license	0.26	0.11	42%	0.04	0.48
Boat charter fee	0.00	0.00	0%	0.00	0.00
Fishing bait	1.13	0.18	16%	0.77	1.49
Hunting license	0.04	0.04	100%	(0)	0.12
Ammunition	0.31	0.26	84%	(0)	0.83
equipment rental	0.56	0.29	52%	(0)	1.14
Guide fees	0.00	0.00	0%	0.00	0.00
Spectator sports fee	0.52	0.29	56%	(0)	1.10
Tourist attraction fee	0.67	0.25	37%	0.17	1.17
Other recreation fee	1.65	0.72	44%	0.21	3.09
film purchasing	2.34	0.29	12%	1.76	2.92
Film developing	1.69	0.24	14%	1.21	2.17
Souvenirs	2.73	0.90	33%	0.93	4.53
Footwear	2.31	0.56	24%	1.19	3.43
Men's clothing	3.04	0.69	23%	1.66	4.42
Women's clothing	4.72	0.99	21%	2.74	6.70
All Other	5.57	1.98	36%	1.61	9.53
Total	249.94	14.81	6%	220.32	279.56

Pct.Error: Standard error of the mean as a percentage of the mean. Two standard errors yield a 95% confidence interval (CI).

Table 13B. Selected error statistics for weekly trip spending by 8 aggregate spending categories, UMRS Marina Users Study (1990-91), n=395.

Item	Mean of Total	Std. Error	Pct. Error	95% CI	
				Mean-	Mean+
LODGING	5.57	1.21	22%	3.15	7.99
FOOD AND BEVERAGE	74.28	4.16	6%	65.96	82.60
AUTO/RV	14.71	1.63	11%	11.45	17.97
BOAT-RELATED	127.83	11.38	9%	105.07	150.59
FISHING	1.39	0.23	17%	0.93	1.85
HUNTING	0.35	0.26	74%	(0)	0.87
ACTIVITY FEES	3.40	0.91	27%	1.58	5.22
MISCELLANEOUS	22.40	2.28	10%	17.84	26.96
Total	249.94	14.81	6%	220.32	279.56

Pct. Error: Standard error of the mean as a percentage of the mean. Two standard errors yield a 95% confidence interval (CI).

of the mean of \$249.94 per week. The 95 percent confidence interval for the mean is two standard errors on either side of the mean. Thus, the 95 percent confidence interval for the overall trip spending estimate is between \$220.32 and \$279.56 per party per week (\$116 to \$148 per party per trip applying the same 6 percent standard error to the \$132 per party per trip average in Table 11B).

The standard errors for trip spending estimates by aggregate category (Table 13B) range from 6 percent (food and beverage) to 74 percent (hunting). The error associated with the activity fees mean is three times the error associated with the boating mean: 27 percent vs. 9 percent, respectively. The larger standard error associated with hunting expenses is primarily a function of the high variance and large proportion of zero spending (99%) in this category (Table 11B).

#### Durable Goods Spending

Within the past year, marina slip renters spent an average of \$3,087 per household on durable items that were used for recreation trips associated with the use of their marina slips (Table 14). Nearly all of this amount (99%) was spent on boat-related durable goods. Ninety-five percent (95%) of the total



Table 14. Spending on durable goods by type, UMRS Marina Users(150 Household).

ALL ITEMS ALL YEARS			ITEMS PURCHASED IN LAST 7 YEARS						\$ per Household per Year
Category	N	\$ per item	N	\$ per item	Tot.Cost \$(000's)	Pct of Total \$	Pct of Subgp.	\$ per Household	
Motor boat	144	30355.73	92	33480.48	3080.20	94%	95%	20398.70	2914.10
Non-Motorized boat	12	10596.30	9	11094.98	99.85	3%	3%	661.29	94.47
Rubber boats	5	725.10	3	806.84	2.42	*	*	16.03	2.29
Jet ski	2	2699.88	2	2700.64	5.40	*	8	35.77	5.11
Sailboat	0	0.00	0	0.00	0.00	0%	0%	0.00	0.00
Boat engines	15	1711.64	8	1021.33	8.17	*	*	54.11	7.73
Boat trailer	8	2680.63	6	3440.54	20.64	1%	1%	136.71	19.53
Waterski	71	100.68	35	93.92	3.29	*	*	21.77	3.11
Boat accessories	191	168.46	83	222.61	18.48	1%	1%	122.36	17.48
BOAT TOTAL	448	10186.22	238	13606.96	3238.46	99%	100%	21446.74	3063.82
Rods & reels	355	45.93	82	55.30	4.53	*	34%	30.03	4.29
Nets & traps	8	35.67	5	50.74	0.25	*	2%	1.68	0.24
Depth finders	52	232.39	33	242.15	7.99	*	59%	52.92	7.56
Fish clothing	27	23.54	13	33.34	0.43	*	3%	2.87	0.41
Boots & waders	5	67.95	3	88.08	0.26	*	2%	1.75	0.25
FISH TOTAL	447	66.33	136	99.09	13.46	*	100%	89.25	12.75
Rifles	2	749.72	2	750.47	1.50	*	100%	9.94	1.42
Bows & arrows	1	69.46	0	0.00	0.00	0%	0%	0.00	0.00
Loading equipment	0	0.00	0	0.00	0.00	0%	0%	0.00	0.00
Hunting boots	4	75.12	0	0.00	0.00	0%	0%	0.00	0.00
Rubber boots	0	0.00	0	0.00	0.00	0%	0%	0.00	0.00
Hunting clothing	3	75.00	0	0.00	0.00	0%	0%	0.00	0.00
HUNT TOTAL	10	208.05	2	750.47	1.50	*	100%	9.94	1.42
Tents	112	52.58	45	62.25	2.80	*	75%	18.55	2.65
Other camp equip.	9	103.02	9	103.35	0.93	*	25%	6.16	0.88
CAMP TOTAL	121	56.33	54	69.10	3.73	*	100%	24.71	3.53
Recreation equip.	18	216.10	11	166.24	1.83	*	30%	12.11	1.73
Other rec. goods	12	422.30	8	539.07	4.31	*	70%	28.56	4.08
ALL OTHER EQUIP.	30	298.78	19	323.22	6.14	*	100%	40.67	5.81
ALL ITEMS TOTAL	1056	8810.59	449	7267.95	3263.31	100%		21611.31	3087.33

Notes: 1. Since small sample sizes were incurred for many items purchased within the past year only, sample sizes for items were increased by computing means for purchases made during the past 7 years.

2. "\$\$ per household per year" computed by dividing \$\$ per household (previous 7 years) by 7.

3. (\*)=Less than 0.5%.

amount was spent on one category: motorized boats. The bulk of the remaining one percent in durable goods spending was spent on fishing gear.

Durable Goods Spending by Item. The sample of 151 marina users reported buying 1,056 durable items used for recreation purposes (Table 14). About 28% of the items reported were major durable goods such as boats, engines, trailers, rifles, and tents. Seventeen percent (17%) of these major durable goods were boats and engines alone. Eleven percent (11%) were tents.

Seventy-two percent (72%) of all durable goods were smaller items like fishing tackle, hunting equipment, and boating and camping accessories. Fishing rods and reels, other fishing gear, boating accessories, and waterskis constituted the majority of smaller items.

Of the 1,056 items purchased by marina users, 12 percent were purchased within the past year and 43 percent were purchased within the previous seven years. The 12 percent and 43 percent figures are somewhat conservative since items purchased in multiple years were excluded from the one-year and seven-year analyses but not from the analysis for all items in all years (this data editing step was discussed in the PROCEDURES section above).

Durable Goods Spending by Location and Residence. About 35 percent of the \$3,087 in durable goods spending, \$1,077 per household per year, took place within the UMRS (Table 15). UMRS residents accounted for approximately two-thirds (65%) of all durable goods spending anywhere and 76 percent of such spending within the UMRS. Residents were more likely to buy durable goods within the region than nonresidents. Forty percent (40%) of resident durable goods spending occurred within the UMRS as compared to 24% for nonresidents. Of the \$1,077 per household spent within the UMRS region, \$1,069 was spent on boats and boating equipment, \$4 on fishing gear, less than \$1 on camping equipment, and \$4 on other recreation durable goods. Across durable items, with the exception of other recreation durable goods, 35 percent or less of all spending occurred within the UMRS. Fifty-one percent (51%) of all spending on other recreation durable goods occurred within the UMRS (Table 15).

Residents spent an average of \$600 per household per year on durable goods, whereas nonresidents spent an average of \$781 (Table 15). Both resident and nonresident durable goods spending was dominated by boats and boat-related durable goods (99% of total durable goods spending for each).

Table 15. Durable spending by place of purchase and place of residence (\$ per household per year),  
UMRS Marina users.

Category	ALL SPENDING				WITHIN UMRS			
	UMRS Resident n=104	Non- resident n=47	Total n=151	Pct. Resident to Total	UMRS Resident n=104	Non- resident n=47	Total n=151	Pct. Resident to Total
Motor boat	2726.92	3328.27	2914.10	64%	1136.81	797.87	1031.32	76%
Non-Motorized boat	137.16	0.00	94.47	100%	22.39	0.00	15.42	100%
Rubber boat	0.55	6.16	2.29	16%	0.00	1.90	0.59	0%
Jet ski	0.14	16.11	5.11	2%	0.14	0.00	0.09	100%
Sailboat	0.00	0.00	0.00	0%	0.00	0.00	0.00	0%
Boat engines	6.70	10.03	7.73	60%	5.63	0.00	3.88	100%
Boat trailer	14.00	31.76	19.53	49%	8.51	30.40	15.32	38%
Waterski	2.58	4.29	3.11	57%	1.41	1.82	1.54	63%
Boat accessories	20.26	11.34	17.48	80%	1.62	0.00	1.12	100%
BOAT TOTAL	2908.31	3407.96	3063.82	65%	1176.51	831.99	1069.28	76%
Rods & reels	4.94	2.84	4.29	79%	1.88	0.00	1.29	100%
Nets, traps	0.02	0.71	0.24	6%	0.02	0.03	0.02	60%
Depth finders	5.87	11.29	7.56	53%	1.50	3.50	2.12	49%
Fishing clothing	0.56	0.09	0.41	93%	0.56	0.00	0.38	100%
Boots & waders	0.36	0.00	0.25	100%	0.36	0.00	0.25	100%
FISH TOTAL	11.75	14.93	12.75	64%	4.32	3.53	4.06	73%
Rifles	2.06	0.00	1.42	100%	0.00	0.00	0.00	0%
Bows & arrows	0.00	0.00	0.00	0%	0.00	0.00	0.00	0%
Hand load equip.	0.00	0.00	0.00	0%	0.00	0.00	0.00	0%
Hunting boots	0.00	0.00	0.00	0%	0.00	0.00	0.00	0%
Rubber boots	0.00	0.00	0.00	0%	0.00	0.00	0.00	0%
Hunting clothing	0.00	0.00	0.00	0%	0.00	0.00	0.00	0%
HUNT TOTAL	2.06	0.00	1.42	100%	0.00	0.00	0.00	0%
Tents	3.34	1.12	2.65	87%	0.36	0.00	0.25	100%
Other camp	1.22	0.12	0.88	96%	0.39	0.00	0.27	100%
CAMP TOTAL	4.56	1.24	3.53	89%	0.75	0.00	0.52	100%
Recreation equip.	2.27	0.55	1.73	90%	2.14	0.00	1.48	100%
Other rec. goods	2.61	7.35	4.08	44%	2.61	0.85	2.06	87%
ALL OTHER EQUIP.	4.88	7.90	5.81	58%	4.75	0.85	3.54	93%
ALL ITEMS TOTAL	2931.56	3432.03	3087.33	65%	1186.33	836.37	1077.40	76%

However, within individual items and categories, there were some noticeable differences. For example, resident marina users spent more per household than nonresidents on non-motorized boats (\$137 vs. \$0), hunting gear (\$2 vs. \$0), and camping equipment (\$5 vs. \$1). Nonresidents spent more on the average than residents for rubber boats, jet skis, boat trailers, and depth finders.

New vs. Used Durable Goods Spending. In the past seven years, marina slip renters purchased 387 new and 62 used recreation durable goods used in conjunction with their marina slips (Table 16). Fifty percent (50%) of total spending was for new durable items.

The used mean of \$26,371 per item is larger than the new mean of \$4,168 per item because the total average cost per item reflects both the cost and the kinds of items purchased. Higher cost items, such as boats and trailers, are more likely to be purchased used. Thus, the new durable goods average is based on a larger number and higher proportion of less expensive items than the used durable goods average. The percentages of new to total spending, which are based on total expenditures and not averages, are the most useful figures for IMPLAN analysis.

Sampling Errors. For marina users, sampling errors for estimates of durable expenses are slightly higher than for trip spending. These larger errors are due to smaller sample sizes and greater variance for the cost of durable items. As a percentage of the mean, standard errors for durable goods are 12 percent overall and 23 percent for spending within the UMRS (Table 17).

Errors are larger for some individual item categories (i.e., hunting, camping, and other). However, since hunting, camping, and other durable goods account for such a small proportion of marina user spending, these errors are not too disturbing. The estimates for boating and fishing equipment are much more accurate.

Errors associated with spending inside the UMRS and total nonresident spending are moderately large (23% each). Future sampling schemes may have to increase the number of marina users slightly to portray more accurately the amount spent by nonresidents and the amount spent within the local area.

Other Annual Expenses. UMRS marina slip renters averaged \$2,255 per household per year in other annual expenses (Table 18). The one-time slip purchase fee

Table 16. Durable spending on new versus used goods by type (items purchased in last 7 years),  
UMRS Marina Users.

Category	NEW			USED			Pct. new of total \$\$ per Item
	N	\$\$ per Item	Total Cost \$(000's)	N	\$\$ per Item	Total Cost \$(000's)	
Motor boat	43	34402.40	1479.30	49	32365.34	1585.90	48%
Non-Motorized boat	4	13249.50	53.00	5	9371.36	46.86	53%
Rubber boat	2	512.65	1.03	1	1395.24	1.40	42%
Jet ski	2	2700.64	5.40	0	0.00	0.00	100%
Sailboat	0	0.00	0.00	0	0.00	0.00	0%
Boat engines	7	1057.00	7.40	1	771.61	0.77	91%
Boat trailer	6	3440.54	20.64	0	0.00	0.00	100%
Waterski	35	86.98	3.04	0	0.00	0.00	100%
Boat accessories	82	224.42	18.40	1	73.99	0.07	100%
Rods & reels	82	55.30	4.53	0	0.00	0.00	100%
Nets, traps	5	50.74	0.25	0	0.00	0.00	100%
Depth finders	33	242.15	7.99	0	0.00	0.00	100%
Fishing clothing	13	33.34	0.43	0	0.00	0.00	100%
Boots & waders	3	88.08	0.26	0	0.00	0.00	100%
Rifles	2	750.47	1.50	0	0.00	0.00	100%
Bows & arrows	0	0.00	0.00	0	0.00	0.00	0%
Hand load equip.	0	0.00	0.00	0	0.00	0.00	0%
Hunting boots	0	0.00	0.00	0	0.00	0.00	0%
Rubber boots	0	0.00	0.00	0	0.00	0.00	0%
Hunting clothing	0	0.00	0.00	0	0.00	0.00	0%
Tents	40	69.23	2.77	5	6.34	0.03	99%
Other camp	9	103.35	0.93	0	0.00	0.00	100%
Recreation equip.	11	166.24	1.83	0	0.00	0.00	100%
Other rec. goods	8	539.07	4.31	0	0.00	0.00	100%
ALL ITEMS TOTAL	387	4168.05	1613.03	62	26371.47	1635.03	50%

Table 17. Sampling errors for durable goods spending estimates, UMRS marina users.

	Mean	Std.Err	95% Confidence Interval		Pct Error
TOTALS					
\$\$ Per Household/Year	3087.33	375.52	2336.29	3838.37	12%
\$\$ in Local Area	1077.40	252.82	571.76	1583.04	23%
BY MAJOR DURABLE ITEM CATEGORIES					
Boat	3063.83	375.29	2313.25	3814.41	12%
Fish	12.74	2.04	8.66	16.82	16%
Hunt	1.42	1.42	(0)	4.26	100%
Camp	3.53	1.44	0.65	6.41	41%
Other	5.82	2.83	0.06	11.58	49%
BY SEGMENTS					
Residents	2931.56	416.23	2099.10	3764.02	14%
Nonresidents	3432.03	784.34	1863.35	5000.71	23%

Note: Pct Error=Standard error of the mean as a percentage of the mean

Two standard errors yields a 95% confidence interval

(37%) and annual slip fees (35%) account for the preponderance of these expenses, followed by boat insurance (16%), and boat storage (9%). Fishing and/or hunting licenses account for less than 1 percent of other annual expenses.

The annual costs of slip fees (private), boat storage, and boat insurance can be directly bridged to IMPLAN sectors in order to derive corresponding economic impacts. The cost of slip improvements and maintenance could also be subjected to input-output analysis, but first more must be known about the economic sectors affected by these activities, the years in which improvements were made, and whether these expenditures were incurred by the boat owner or the marina operator. Fishing and hunting licenses and boat registration fees are generally considered transfer payments to other units of government. Licenses and fees are excluded from local impact analyses unless some portion is returned from the state to local units of government and that portion can be ascertained.

#### DISCUSSION

This section is divided into four major parts. The first part deals with the relative similarities and differences between dock owner and marina

Table 18. Other annual or durable goods expenses by type, UMRS Marina Users.

Category	\$\$ per Household	Tot. Cost \$(000's)	Pct of Total	Pct of subgp.
Hunt/Fish. License (MN)	3.07	0.46	*	36%
Hunt/Fish. License (WI)	1.28	0.19	*	15%
Hunt/Fish. License (IL)	1.14	0.17	*	13%
Hunt/Fish. License (IA)	2.54	0.38	*	30%
Hunt/Fish. License (MO)	0.48	0.07	*	6%
ALL HUNT/FISH. LICENSE	8.51	1.29	*	100%
Maintenance Cost	30.71	4.64	1%	
Boat Registration	23.91	3.61	1%	
Boat Storage	205.80	31.08	9%	
Boat Insurance	354.05	53.46	16%	
Annual Slip Fee	779.77	117.75	35%	
Slipfeature Installed	28.41	4.29	1%	
One-time Slip Purchase	823.84	124.40	37%	
ALL TOTAL	2255.00	340.51	100%	

(\*)=Less than 0.5%.

user spending profiles. In addition, these two profiles are compared to the six visitor segment profiles generated in the developed site portion of the total UMRS study (Propst et. al 1992). Secondly, sampling errors between the two portions of the total UMRS study are compared. Thirdly, an assessment of study limitations is provided. The fourth part summarizes general applications of the spending profiles and contains references to the sources where specific applications may be found.

### Visitor Segment Profiles

In the developed site portion of the total UMRS study, spending profiles for six predefined visitor segments were developed:

1. resident, day use boaters
2. resident, day use nonboaters
3. resident, overnight visitors
4. nonresident, day use boaters
5. nonresident, day use nonboaters
6. nonresident, overnight visitors

These segments were formed by the combination of factors (i.e., resident or nonresident, day or overnight visitor, boater or nonboater) which minimized the variation in expenditures within each segment. Thus, these six segments are relatively homogeneous with respect to their spending patterns.

Dock owners and marina slip renters constitute two additional visitor segments assumed to be relatively homogeneous in their expenditures. These two segments represent distinct subgroups in terms of recreation use and expenditure patterns.

Dock Owner vs. Marina User Profiles. In terms of variable trip costs, marina users outspent dock owners substantially on a per trip basis (\$132 vs. \$86, dollars per trip, respectively). The same is true for total expenditures as marina users reported more trips than dock owners (see St. Paul District's "Recreation Use and Activity Report" -- 1992). Trip expenditures within the UMRS exceeded 80 percent for both groups.

By expenditure category, the most noticeable difference between the two groups was that marina users spent, proportionately, 20 percent more on boat-related items than dock owners (51% vs. 31% of the overall average, respectively). The sample of dock owners tended to spread this 20% differential among more items as reflected in slightly higher proportions of dock owner spending for all remaining categories (Tables 2B and 11B). This difference is



not too surprising given that marina users likely spend more time in recreation activities directly related to the use of the boat, whereas dock owners may engage in more of a mix of boating and non-boating recreation activities. Furthermore, marina users have much more expensive boats than dock owners. The average boat cost for marina users was more than six times the average cost per boat for dock owners (\$33,480 vs. \$5,286, respectively). Thus, it is reasonable for marina users to spend more money than dock owners on such variable trip costs as boat gas and oil, boat repairs, and boat parts. Again, these conclusions are based on the averages per trip and not on total expenditures. However, given the substantially higher number of trips reported by marina users than dock owners (see St. Paul District's "Recreation Use and Activity Report" -- 1992), it is logical to conclude that total expenditures by marina users, for the items directly measured in this study, exceed those of dock owners.

By place of residence (Tables 3 and 12), nonresident marina users spent a higher proportion locally than nonresident dock owners (88% vs. 66%, respectively, spent within 30 miles). Both resident and nonresident marina users spent 3 to 4 times as much on boat-related items as dock owners. Furthermore, unlike dock owners, a substantial proportion of nonresident marina user spending on boat-related item occurred locally.

The pattern of dock owners purchasing a wider variety of items but spending less per comparable item than marina users appears in both trip and durable goods spending. The extreme difference in average boat cost has already been highlighted. There were other differences in durable goods spending patterns as well:

On an item-by-item basis,

1. dock owners purchased about three times as many durable items in the past seven years as compared to marina users (1,291 vs. 449 items, respectively, in Tables 5 and 14).
2. dock owner dominance in the number of durable fishing and hunting items purchased was particularly noticeable (Tables 5 and 14).

On a total cost basis,

1. marina users outspent dock owners by a factor of 4.6 (\$3,263,000 vs. \$702,000), a clear result of much more expensive boats purchased by marina users (Tables 5 and 14).

Within the UMRS,

1. the average durable spending by marina users (\$1,077 per household per year) was twice that of dock owners (\$502 per household per year) (see Tables 6 and 15).

2. however, marina users spent 65 percent of their average durable expenditures outside of the UMRS (1-(\$1,077/\$2,287)), whereas dock owners spent 15 percent (1-(\$502/\$668)) outside the UMRS (Tables 6 and 15).
3. the same pattern of proportionately more average spending outside the UMRS than within by marina users held for both residents and nonresidents (Tables 6 and 15).

For motorized boats only,

1. marina users outspent dock owners outside the UMRS by a ratio of 2.3 to 1 (\$1,031 vs. \$370 per household per year in Tables 6 and 15).
2. 58 percent of the average amount spent by resident marina users for all motorized boats was spent outside the UMRS (1-(\$1,137/\$2,727)); the comparable ratio for resident dock owners was 10 percent outside the region (1-(\$371/\$413)) (Tables 6 and 15).

Developed Site Segments Compared to Dock Owners. In comparison to the developed site study, dock owners' average trip spending is slightly higher (\$86 vs. \$72 per party per trip). Dock owners deviate from the full sample of on-site visitors by spending proportionately less on lodging (4% vs. 12%), less on auto/RV items (11% vs. 21%), and more on boat-related items (31% vs. 14%).

Dock owners most closely resemble the spending pattern of resident/day use/boaters (R/D/B) because the proportionate spending on lodging, boating, fishing, hunting, activity fees, and miscellaneous items is similar between the two segments. Also, both segments make high proportions (more than 80%) of trip expenditures locally. Differences include higher average spending by dock owners than the R/D/B segment (\$86 vs. \$55 per party trip), a greater proportion spent on food and beverages, and a lower proportion spent on auto/RV items.

Durable goods spending comparisons are more difficult to make as averages are reported in different units for reasons explained earlier: dollars spent per party trip for the developed site segments and dollars spent per household per year for dock owners and marina users. Therefore, the only valid comparisons are those made on a proportional basis, in which case dock owners closely resemble resident/day use/boaters in percentages spent on boat-related durable goods, fishing gear, and all other durable goods. Like the R/D/B segment, dock owners also spend a large proportion on durable goods in the UMRS region (75% vs. 76%).

Developed Site Segments Compared to Marina Users. In comparison to the developed site study, marina users' average trip spending is nearly twice as high (\$132 vs. \$72 per party per trip). Marina users deviate from the full sample of on-site visitors by spending proportionately less on lodging (2% vs. 12%), less on auto/RV items (6% vs. 21%), and substantially more on boat related items (51% vs. 14%).

Marina users do not resemble any of the six developed site segments in their trip spending patterns. A high proportion spent on boat-related items, coupled with low spending for lodging and auto/RV, sets marina users apart from the rest.

In terms of durable goods spending, marina users most closely resemble nonresident/day use/boaters (NR/D/B) in percentages spent on boat-related durable goods (99% vs. 91%) and all other durable goods (1% vs. 9%). However, the almost total domination of durable goods spending on boat-related items to the exclusion of all else is a distinguishing feature of the marina user segment. Marina users spend slightly higher within the UMRS than the NR/D/B segment (35% vs. 25%).

#### **Sampling Error**

Standard errors (expressed as a percentage of the mean) for dock owners and marina users are comparable to those resulting from the developed site portion of this study. They are also within the 20 percent error tolerance limit recommended in Propst et. al (1992). For the developed site study, sampling errors for total trip and durable goods spending were 8 percent and 14 percent, respectively. For dock owners, the sampling errors were 11 percent for total trip spending and 13 percent for durable goods spending. The marina user sample displayed sampling errors of 6 percent (trip) and 12 percent (durable).

By place of residence for durable goods only, UMRS resident spending is below the 20 percent error threshold for both dock owners and marina users. For dock owners, nonresident sampling error for durable goods spending is 20 percent; for nonresident marina users, the error is 23 percent. Thus, future studies interested in reporting durable goods spending by nonresidents would need to consider a goal of 200 to 250 dock owner or marina user households or tolerate errors larger than 20 percent.

## Limitations

1. The potential for double counting of visitor segments is not known.

The design of the overall UMRS study did not incorporate a clear means of determining if those surveyed at developed sites were also dock owners or marina slip renters. This is not so much a problem for estimates of average trip and durable goods spending as it is for estimates of total recreation use and spending.

2. Computing durable goods costs on a yearly basis per household does not account for the portion of durable expenditures that could be associated with non-UMRS sites where that equipment may be used.

No attempt was made to apportion the costs of durable goods to the UMRS versus other places where they may be used. Allocation schemes based, for example, on frequency of use on the UMRS versus elsewhere are largely ad hoc. Without valid methods for allocating durable goods spending across multiple locations, it must either be assumed that durable goods would not have been purchased if docks and marina slips along the UMRS did not exist, or durable expenses must be expressed as being "associated with trips to the UMRS." The assumption that durable goods would not have been purchased if opportunities along the UMRS did not exist is likely not as problematic for the dock owner or marina user results as it is for the developed site results. There may be fewer substitute dock or marina slip opportunities than developed site opportunities outside the UMRS.

3. The extent to which use of seasonal homes might effect resident and non-resident spending patterns could not be assessed due to low sample sizes.

During the profile interviews, information concerning the ownership and location of seasonal homes was gathered. Twenty-three (23) of the 42 dock owner nonresidents owned seasonal homes with docks inside the UMRS. Keeping all nonresidents in one segment is valid if one assumes that the amount of time they spend on a given trip to their seasonal homes is relatively short. Under this assumption, the seasonal home is treated like another type of temporary lodging, in which case the spending by these 42 households resembles the spending pattern of, say, nonresidents lodging with friends or relatives.

If, however, these households (or some portion) spend a significant amount of time at their seasonal homes, then their spending patterns may be more like those of residents. In this case, some nonresident households should perhaps be treated as a separate segment for computation of total use and spending.

This separation would not change the amount counted as nonresident spending for economic impact analysis. All 42 households would still be considered nonresidents whose spending injects new dollars into the study region. However, instead of two dock owner segments (residents and nonresidents), there would be three: residents, nonresidents who spend like residents, and other nonresidents. The purpose of further segmentation would be to create dock owner groups that are relatively homogeneous in their spending patterns. Increasing homogeneity in spending patterns reduces the variance in spending estimates.

One hundred seven (107) dock owners reported owning a seasonal home. One hundred three (103) out of 150 dock owners (69%) said they had a dock at their seasonal home. Since the expenditure items asked dock owners to report expenses for recreation trips associated with their docks, the finding that over two-thirds of docks are located at the seasonal residence of dock owners makes the seasonal home spending issue an important one to discuss.

For marina users, only 9 out of 151 reported owning a seasonal home. Thus, segmenting marina nonresidents based on seasonal homes usage is likely unnecessary. However, if some slip renters use their boats like seasonal homes for a portion of the year, then the same dichotomy of marina nonresidents may be valid.

The sample of nonresidents in this study is not large enough to provide valid results with any further splitting into segments. However, future studies of dock owner or marina user expenditures may want to consider increasing the sample size of nonresidents sufficiently to allow for further segmentation.

### Applications

For the entire UMRS study, a total of eight visitor spending profiles are available. The ways in which these profiles may be used to address management, planning, and policy issues associated with the UMRS are discussed in detail in the developed site report (Propst et al. 1992). To summarize from this report, economic impact applications may be divided into those involving the use of IMPLAN and those which do not.

As to the non-IMPLAN applications, the eight spending profiles may be expanded to the total population of users and then to total recreation expenditures for each segment or in various combinations of segments (e.g., all boater segments). This calculation of total recreation expenditures requires

the multiplication of spending profiles by estimates of party trips. In the case of dock owner and marina user durable goods spending, profiles must be multiplied by estimates of the total number of households (not party trips) to derive total expenditure figures.

Total expenditure estimates may be derived not only by visitor segment, but also for the entire UMRS region, the five subregions described in the developed areas report, or (with some adjustments), for individual states, communities, or sites. Total expenditure calculations can readily be carried out on spreadsheets to estimate shares of spending by sector or segment.

These total expenditures may be further modified for input into IMPLAN-PC, thus permitting more precise estimation of economic effects. IMPLAN applications are discussed in Stynes and Propst (1992) and illustrated in the St. Paul District's Economic Impacts report (1992 -- available from St. Paul District).

LITERATURE CITED - PART TWO

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